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A REVIEW OF THE STRATIOMYIA AND ODONTOMYIA OF NORTH AMERICA.

BY CHARLES W. JOHNSON.

The object of this paper is to try and make clear the specific characters of the species that have been placed in these two genera. That there are many synonyms in the present list is apparent to all who have attempted to determine the species. Of the species pertaining to the United States I have examined a great deal of material, and carefully studied all available types, but the want of material from Mexico leave many doubtful and undetermined species. That some of the species of Bellardi and Gerstaecker, described from Mexico, are the same as those described from Texas and California, seem evident, and if so, would have priority; yet it would be unadvisable to do this without a thorough study of the Mexican species. While varying considerable in many structural characters, these variations, when studied collectively, seem hardly sufficient to be of generic importance. I therefore refrain in this present paper from adopting any additional genera until typical specimens of described genera have been studied.

I here wish to express my sincere thanks to Mr. Samuel Henshaw, through whose kindness I was permitted to examine the type in the Museum at Cambridge; to Dr. S. W. Williston and Mr. W. A. Snow, of the Kansas University, for the loan of specimens, the comparing of specimens with Day's types and valuable information; to Prof. C. V. Riley, for the privilege of examining the large collection in the National Museum; to Prof. Lawrence Bruner and Mr. W. D. Hunter, of the University of Nebraska; and to Prof. J. M. Aldrich, Mr. D. W. Coquillett, Dr. W. A. Nason, Prof. G. C. Davis, Mrs. Annie T. Slosson and others, for the generous loan of specimens.

STRATIOMYIA.

Stratiomys Geoffroy, Hist. Nat. d. In. ii, 475, 1764.

Stratiomyia, as amended by Loew, Centur. vi, 4.*

Rather large; black with yellow markings, pile or tomentum variable. Head hemispherical; eyes of the male contiguous, but

* "Geoffroy, in translating Reaumur's *Monche armee*, evidently meant to make the name *Stratiomyia* and not *Statiomys*, which is nonsensical" (Osten Sacken).

broadly separated in the female; ocelli prominent, face rounded, antennæ inserted slightly above the middle of the head; first antennal joint three or four times as long as the second; third joint as long as the first and second together; without style or bristle and composed of five annuli. Thorax quadrate, pilose in the male, tomentose in the female; scutellum prominent and always with two spines. Abdomen as long as the head and thorax together; ovate, thick and convex, with five visible segments. Legs of moderate size, with little variation; tibiæ without spurs. Wings brownish hyaline, veins reddish brown, anterior veins crowded, third longitudinal vein branched, discal cell emits three veins of equal size, thus forming five distinct posterior cells; discal cell subtriangular, first and second basal cells equal, anal cell always closed, seventh longitudinal vein rudimentary.

Type of the genus *S. chameleon* Linné, of Europe.

In comparing our species with those of Europe, we find, as is quite characteristic of the North American fauna, that the species which nearest resembles the type are those from the Pacific slope: *S. barbata* and *S. melastoma*. This remark also applies to the following note on *Thyreodonta* (*S. maculosa* Loew); and to the genus *Odontomyia*; a western species, *O. binotata*, being the nearest representative in size and color to *O. ornata* of Europe, although it extends much further east than the species of *Stratiomyia* referred to.

While the foregoing description applies to the typical forms, there are others included that show some modifications, but which are not of sufficient importance to be of generic value.

Rondani founded the genus *Thyreodonta* in "eyes hairy," type *S. strigata* Fabr. (*S. longicornis* Scop., of Europe. To this would belong *S. maculosa* Loew, of California. But, when we come to our eastern species, *S. badius* Walk., we find that only the male has hairy eyes. This character, therefore, can be considered only of specific value, or at most a section or group.

There are several species found from Texas to South America which differ considerably from the typical form in general appearance, yet lack distinctive generic characters. The head of both male and female is much wider than the thorax, the third joint of the antennæ flattened and sublanceolate, the abdomen somewhat flattend, the anterior third of the wing a reddish brown color, and, as a rule, they are somewhat smaller. Gerstaecker (Linn. Entom. xi, 321) speaks of this differentiation. It is really a Mexican and South

American group, being represented, as far as known, by only one species within the United States—*S. constans* Loew, Texas. I propose for this the group *mutabile* from its typical and widest distributed species, *S. mutabilis* Fabr.

Of the life habits of the American species little is known. Dr. Williston (Standard Nat. Hist. vol. ii, page 416) gives the following account: "The larvæ lives in water, earth, or decaying wood. Those of a species of *Stratiomyia* are known to inhabit some of the western alkaline lakes, and a European species is found in salt water. The transformations of *S. chameleon* in Europe are well known. The eggs are deposited by the female in layers overlapping each other on the under side of leaves of aquatic plants. The larvæ are naked, smooth, broader in front, where there is a small head; the sides of the abdominal segments are provided with a hook-like foot process. The last three are much narrowed and elongated, the terminal are especially so, and at its tip with a circlet of hairs surrounding the stigmata. When they breathe these hairs enable the larvæ to keep themselves at the surface, and by their means, when folded, they can retain a small bubble of air and carry it with them beneath the surface. Their food consists of very small aquatic organisms. They swim about in vertical, undulatory motions. The pupæ are enclosed in the anterior end of the larval skin, which enables them to float about freely in the water. They escape at maturity through a slit in the back which has become exposed to the air." The perfect insects are generally found on flowers, and are noticeably more numerous in the vicinity of streams and ponds.

The following note from a recent article by Prof. Lawrence Bruner (*Evening Call*, Lincoln, Neb., April 5, 1895) on the peculiar habit of a Stratiomyid larva may prove of interest. The specimens were found by Mr. John C. Hamm in the thermal springs of Ninta County, Wyoming. * * * "At the time I saw the larvæ in their native habitation I did not have a thermometer with which to take the temperature, but the water was so hot where I saw them I could not hold my hand in it. My best judgment is, and was at the time, that the water was not more than twenty or thirty degrees below the boiling point." * * * "In color they are dull gray, in form much flattened, and in size the length of the line below the figure (15 mm.). The two specimens examined by me are more or less incrustated with sulphur and other mineral substances."

The number of species recorded from North America, in Osten

Sacken's Catalogue, is thirty-nine (ten from Mexico). Bigot has since described six, making a total of forty-five species. Macquart's *S. flavipes*, *S. puchella* and *S. vicina*, I can only refer to *Odontomyia flavicornis* Oliv. This synonymy has been caused by the unusual length of the first antennal joint, and in the great difference between the male and female. Loew's *S. angularis*, *S. marginalis* and *S. nigriventris*, are undoubtedly the same as *S. meigenii* Wied. Loew's *S. notata* and *S. quadrigemina* are only color varieties of *S. normula* Loew. *S. lativentris* and *S. obesa* Loew, are synonyms.

S. insignis is the ♂ of *S. maculosa* Loew (Osten Sacken, Western Diptera, 203).

S. lineata Macq. I refer doubtfully to *S. meigenii*. Of Walker's species *S. badius*, being positively identified, has priority over *S. picipes* Loew.

S. nymphis I refer doubtfully to *S. laticeps* Loew, the other five (three Mexican) remain unidentified. For a want of material none of the Mexican species (except *S. mutabilis* Fabr.) have been identified; but, as they should be studied conjointly, I have added, for convenience, a description of all the species.

Of Bigot's species *S. dentata* ♀ and *S. lacerta* ♂ are unquestionably *S. maculosa* Lw. *S. diademata* and *S. calopus* equals *S. barbata* Lw. A very black species from Weber Lake, California, I refer to *S. nevadæ*. *S. simplex* remains unidentified.

In the following table I have only included those Mexican species that from the descriptions seem undoubtedly distinct.

- | | |
|--|------------------------|
| 1.—Head of ♂ ♀ narrower than the thorax..... | 2. |
| Head of ♂ ♀ wider than the thorax..... | 6. |
| 2.—Eyes of ♂ ♀ glabrous..... | 3. |
| Eyes of ♂ pubescent..... | 13. |
| 3.—Antennæ; third joint but slightly flattened..... | 4. |
| Antennæ; third joint greatly flattened and sublanceolate..... | 14. |
| 4.—Abdominal spots usually connected on the fourth segment of the male, and always connected on the fourth and usually on the third segment of the female..... | 5. |
| Abdominal spots never connected on the fourth segment of the ♂ and rarely connected in the ♀..... | barbata Lw. |
| 5.—Fifth segment with a large keystone-shaped marking..... | melanostoma Lw. |
| Fifth segment with a dorsal line and spot at the anterior angle..... | lativentris Lw. |
| 6.—Abdomen; lateral triangular markings on the second and third segments, widely connected at the lateral margin..... | Bruneri n. sp. |
| Abdomen; lateral subtriangular markings on the second and third segments not connected at the lateral margins..... | laticeps Lw. |

- 7.—Scutellum yellow, or with base narrowly black.....8.
 Scutellum black, or with a narrow apical margin of yellow.....10.
 8.—Fourth segment with a small dorsal triangle, vertex of the ♀ black.

normula Lw.

Fourth and fifth segments with small dorsal triangles, vertex of the ♀ yellow.....**norma** Wied.

- 9.—Dorsal triangles on the third and fourth segments, that on the fourth (and sometimes the third) connected with the lateral margins.

unilimbata Lw.

Dorsal triangle wanting on the third, that on the fourth obsolete or wanting, wings unusually dark.....**senaria** Lw.

- 10.—Abdomen with narrow lateral markings.....11.
 Abdomen wholly black ♂ (♀ unknown).....**nevadae** Bigot.

- 11.—Fifth segment with a dorsal line; lateral markings on the segments of the ♀ very narrow.....**Meigenii** Wied.

Fifth segment with a dorsal triangle; lateral markings on the segments of the ♂ ♀ prominent.....**apicula** Lw.

- 12.—Pile on the thorax unusually long and dense; abdomen wide, third and fourth segments very convex.....**discalis** Lw.

Pile on the thorax normal; abdomen narrow, and third and fourth segments noticeably convex.....**quaternaria** Lw.

- 13.—Face of ♀ yellow, ♂ black; abdomen with a wide, maculated or indented lateral margin; variable.....**maculosa** Loew.

Face of ♂ ♀ yellow; with a longitudinal line of black; abdominal markings transverse, the same in both sexes; eyes of ♀ glabrous.

badius Walker.Group *mutabile*.

- 14.—Abdomen: bands on the second segment interrupted, third and fourth continuous.....15.

Abdomen; fourth and fifth segments only with wide yellow bands.

mutabilis Fabr.

- 15.—Scutellum ♂ black.....16.

Scutellum ♂ ♀ yellow.....**constans** Lw.

- 16.—Abdomen; bands on the second and third continuous.

Gerstaeckeri Bell.

Abdomen; second segment with two large spots.....**bimaculata** Bell.

Stratiomyia barbata Loew (Pl. iii, figs. 1 and 2).

Stratiomyia barbata Loew, Centur. vi, 9.

Stratiomys diademata Bigot, Ann. Soc. Ent. France, xxxviii, 23.

Stratiomys calopus Bigot, Ann. Soc. Ent. France, xxxviii, 23.

♂ ♀. Length 13 mm. ♂.—Face black, with blackish pile around the base of antennæ, and yellowish pile below; a large spot on each side of the facial prominence, and the lateral and lower part of the occiput yellow; the occiput is laterally very prominent, apparently ending abruptly towards the vertex, where it becomes black and obscured by the eye, which extends to the edge of the vertical angle. Antennæ black. Thorax black, with blackish pile; scutellum yellow, base and sides black, spines reddish; halteres green. Abdomen black, with yellowish pile and lateral markings, second segment with a large triangular spot

at the posterior angles, third and fourth with an oblong spot at the lateral posterior margins narrowly reaching the posterior angles; a large central triangle on the posterior half of the fifth; venter black, the segments with a wide posterior margin of greenish yellow; femora black, with long, black pile; tips of the femora, the tibiae and tarsi, reddish; tibiae with a medial band of brown. Wings dusky hyaline, veins yellowish; discal cell emits three veins.

♀.—Face, front and vertex black, with yellow pile; a large, square spot on each side of the facial prominence, two ovate spots on the front, and one on each side of the ocelli extending over the vertical angle onto the cervix, and the occiput yellow. In some specimens the yellow of the face and front are connected at the orbits, in which case the face and front might be described as yellow, longitudinally divided by black; scutellum yellow, base narrowly black; the lateral abdominal markings usually the same as those of the male, though occasionally the markings on the fourth segment are narrowly connected.

Seattle, Wash. (Prof. O. B. Johnson); Mt. Hood, Oregon (Morrison, Univ. Kans.); Laramie, Wyoming, July 17 (Univ. Neb.); Colorado, July 8 (Amer. Ent. Soc.); Craig's Mt. Idaho; British Columbia (Aldrich).

Two females from Colorado, and two out of eight of the males from Craig's Mt. Idaho have the markings on the fourth segment narrowly connected.

Stratiomyia melanostoma Loew (Pl. iii, figs. 3 and 4).

Stratiomyia melanostoma Loew, Centur. vi, 10.

Length ♂ ♀ 12-15 mm. ♂.—Face yellow, with light yellow pile; frontal triangle, medial facial line and mouth, black; occiput totally yellow, lateral portions somewhat dilated. Antennæ black, second joint brownish. Thorax black, with blackish pile; a tuft of yellowish pile on the pleura below the humeri; scutellum yellow, base narrowly black, spines reddish. Abdomen black; a lateral posterior triangle on the second, an elongated spot on the lateral posterior margins of the third and fourth, which narrows toward the lateral margins, usually connected on the fourth; and a central disc or subtriangular spot on the fifth segment yellow; venter yellow, base of the segments variably marked with black, which is more conspicuous on the third and fourth segments; femora black, tips of the femora, the tibiae and tarsi, yellowish; tibiae obscurely annulated with brown. Wings brownish hyaline.

♀.—Face, front and occiput, yellow; vertex black, with a yellow spot on each side of the ocelli extending over the vertical angle; there is a narrow black fasciæ and frontal line that connects the black surrounding the base of the antennæ with that of the mouth and vertex; sometimes the frontal line is bifurcated, thus forming a yellow spot below the ocelli; there is also a small black spot on the orbit opposite the base of the antennæ, but this and the frontal line in some specimens is entirely wanting. The yellow spots on the third and fourth segments are larger and connected on both segments, thus forming irregular posterior borders; the discal spot on the fifth is also larger, leaving only a narrow lateral and anterior margin of black.

California (Baron); Mt. Hood, Oregon (Morrison, Univ. Kans.); Summit Station, Sierra Nevada, July 4 (H. Edwards).

Stratiomyia lativentris Loew (Pl. iii, figs. 5, 6).*Stratiomyia lativentris* Loew, Centur. vi, 8.*Stratiomyia obesa* Loew, Centur. vi, 11.

Length ♂ ♀ 13 mm. ♂.—Face and occiput yellow, pile yellow; a wide facial line, frontal triangle and mouth black. Antennæ black. Thorax black, with yellowish pile; scutellum and spine yellow, base black. Abdomen black; second, third and fourth segments with an elongated yellow spot at the lateral posterior margin, those on the fourth segment usually connected, forming a posterior margin; also a small spot at the anterior angle of the third, fourth and fifth segments; fifth with a narrow lateral margin and a dorsal line of yellow; venter yellow, segments with an irregular band of black at the anterior margins. Femora brownish, with a preapical band of black; tips of the femora, the tibiæ and tarsi yellow; tibiæ with a medial band of brown. Wings hyaline, brownish, somewhat lighter towards the end, veins reddish.

♀.—Face, front and occiput, yellow; vertex black, with two yellow spots on the vertical angle, in some specimens the black of the vertex extends along the frontal orbits and connects with a narrow transverse line that extends from the base of the antennæ; frontal fovea, mouth and a narrow facial line extending from the base of the antennæ to the mouth black; black at the base of the scutellum narrower than in the male. The abdominal markings are more prominent than the male, those on the third sometimes connected, thus forming a posterior margin to both the third and fourth segments; there is a prominent spot at the anterior angle of the second, third and fourth segments, on the fifth the spots at the anterior angles are sometimes connected with the dorsal line, leaving two triangular spots and a narrow anterior margin of black. Legs yellow; femora with a broad preapical band of brownish black.

Toronto, Ont., June 17, July 12 (Wm. Brodie); Buffalo, N. Y. (Kansas Univ.); Northumberland County, Pennsylvania (H. G. Klages); Agricultural College, Michigan (Davis); Champaign County, Illinois (W. A. Snow); Algonquin, Ill. (Dr. Nason); Brookings, S. D. (Aldrich).

In the type (♀) the abdominal markings are intermediate between the ♂ and ♀ figured, the markings on the second segment are more triangular, those at the anterior angles wanting, while the fifth segment is like that of the ♂. In the nine specimens before me there is a great variation in the abdominal markings.

Stratiomyia Bruneri n. sp. (Pl. iii, figs. 7, 8).

Length ♂ ♀ 13 mm. ♂.—Face yellowish; frontal triangle, a wide medial line, cheeks and oral margins black, with yellow pile; black of the frontal triangle extending slightly downward along the facial orbits; occiput narrowly margined with yellow. Antennæ black; first joint noticeable shorter than in most of the species. Thorax black, with long yellow pile; scutellum and spines yellow, base black. Abdomen black; a small lateral quadrate spot on the first, triangular markings on the second and third laterally connected; a transverse spot on the lateral posterior margin of the fourth, and the posterior half of the

fifth yellow; venter greenish yellow; base of the fourth and fifth segments narrowly marked with brownish black. Legs reddish; coxæ and a wide preapical band on the femora black. Wings hyaline, veins yellow.

♀.—Face, front and occiput yellow, shining; vertex, a transverse marking in the fovea above the base of the antennæ, and oral margin, brown. Thorax with short golden tomentum; pleuræ, posterior angles and the base of the scutellum, brownish; in one specimen the entire scutellum is reddish, but this is evidently a discoloration. The markings on the lateral posterior margin of the fourth segment are subtriangular, and almost connected at the posterior margin; on the fifth there is only a narrow anterior margin of black; all the abdominal markings are widely connected at the lateral margin; venter wholly greenish yellow. Legs of a uniform reddish color; coxæ brownish black.

Three specimens, Custer, S. D. (Univ. Nebraska).

Stratiomyia laticeps Loew (Pl. iii, fig. 9).

Stratiomyia laticeps Loew, Centur. vii, 20.

? *Stratiomys nympha* Walker, List, iii, etc., 530.

Length ♂ ♀ 11-12 mm. ♂.—Face and frontal triangle black, with white pile; facial and occipital orbits yellow. Antennæ black and noticeably shorter in this species than in any of the others. Thorax black, clothed with a thick, yellowish white pile; scutellum and spines yellow, base black. Abdomen black, marked at the posterior angles of the second, third and fourth segments by a subtriangular spot of yellow, those on the fourth narrowly connected; fifth with a narrow lateral margin and a central posterior triangle of yellow; ventral segments yellow, with a basal band of black, interrupted on the second and third; the third also having two small brown central spots. Femora black, tips of the femora, the tibiæ and tarsi, yellow; tibiæ with a medial band of brown. Wings hyaline, veins red.

♀.—Face, front and occiput yellow, shining; pile white; vertex, a spot above the base of the antennæ, medial facial line and oral margins black. Legs in one specimen totally yellow; femora slightly darker. The black band on the third ventral segment continuous in one and interrupted in the other; lateral marking on the fourth segment not connected.

Two specimens (♂ ♀), Montana (Coquillett); one ♀, Utah (Aldrich); Ogden, Utah, June 20 (collection C. V. Riley, U. S. Nat. Mus.); Reno, Nevada (Wickham).

The type of *S. laticeps* is somewhat larger (14 mm.). The following notes are from specimens in the Museum of Comp. Zoology:

♀.—Femora varying from reddish brown to black; ♂—the posterior margin of the fourth segment narrowly interrupted, and the base of the scutellum widely black. Weber Lake, Cal., July 22 (Osten Sacken); The Dalles Oreg. June 23, Yakima River, Ellensburg, Wash., July 8 (Dr. Hagen); Twin Lake, Col. (Osten Sacken). The later Baron Osten Sacken referred to *S. nymphis* Walker. That this is Walker's species seems quite evident, but a study of the type is necessary.

Stratiomyia normula Loew (Pl. iii, fig. 16).*Stratiomyia normula* Loew, Centur. vi, 5.*Stratiomyia quadrigemina* Loew, Centur. vi, 4.*Stratiomyia notata* Loew, Centur. vi, 18.

Length ♂ ♀ 11–12 mm. ♂.—Face black, shining, with whitish pile. Antennæ black. Thorax black, with long yellowish pile, thickest on the pleuræ: basal half of the scutellum black, apical half and spines yellow. Abdomen black, with the following markings of yellow: second segment with a large lateral triangle, third with a narrow lateral margin (widest at the anterior angle) and a transverse marking at the lateral posterior angle, fourth similar, except that the lateral and lateral posterior margin is usually narrowly interrupted, it also has a small dorsal triangle at the posterior margin, fifth with a narrow lateral margin (obsolete posteriorly) and a central dorsal line; venter black; segments with a lateral and posterior margin of yellow. Femora black; tips of the femora, tibiæ and tarsi, yellow; tibiæ with a medial band of brown. Wings brownish, hyaline, veins red.

♀.—Face black, whitish pile; facial orbits and a subcordate spot below the ocelli yellow; lower part of the occiput yellowish; yellow of the scutellum more prominent. Abdominal markings similar, except that the lateral and lateral posterior margin is usually interrupted on the third, and the lateral posterior marking on the fourth are less prominent, and in some specimens almost wanting. Femora and outer two-thirds of the tibiæ black; the posterior tibiæ and terminal joints of tarsi brownish: tips of the femora, basal portion of the tibiæ and the first two joints of the tarsi, reddish; the color of the tibiæ and tarsi are somewhat variable.

Var. *quadrigemina* Loew (♂).—This is a color variation in which the markings on the third segment are the same as those on the second, that is, a large lateral posterior triangle. I have in my collection a specimen that is intermediate between this and the typical *S. normula*. A specimen in the Museum Comp. Zool. marked, “a *quadrigemina*, *norma* or *normuli*, differs in the flavo-himaculata,” is another of these intermediate forms. The male of *S. normula* is similar to that of *S. norma*, but the latter may be distinguished by the greater amount of yellow on the scutellum; the presence (usually) of a small dorsal triangle on the third, and more hirsute abdomen.

Var. *notata* Loew.—In this variety there is a transverse marking at the lateral posterior margins of both the second and third segments. There is also proportionately less yellow on the lateral margins, but with upwards of twenty specimens before me I can readily connect it with the typical *S. normula*. The two forms were taken on the same day by Mr. Wm. Brodie.

Toronto, Ontario, July 8, 12 and 17 (Wm. Brodie); New York (Osten Sacken); Agricultural College, Michigan (Davis); Algonquin, Ill., June 2 (Dr. Nason); Brookings, S. D. (Aldrich); War Bonnet Canyon, Neb. (Univ. Neb.).

Stratiomyia norma Wiedemann (Pl. iii. figs. 17, 18).*Stratiomys norma* Wied., Auss. Zw. ii, 62, 3.

Length ♂ ♀ 12-13 mm. ♀.—Face, lower part of the front, frontal and vertical orbits, ocelli and upper part of the occiput black, with yellowish pile; facial orbits, a large spot on the front and vertex extending on each side of the ocelli over the vertical angle and the lower part of the occiput yellow. Antennæ black. Thorax black, with yellow and brownish tomentum; scutellum yellow, base black; spines red. Abdomen black, with yellowish and blackish pile, and the following yellow, or greenish yellow markings; a prominent triangle at the posterior angle of the second segment, third with a small triangle at the anterior angle, a transverse marking at the lateral posterior margin, and a small dorsal triangle at the posterior margin; fourth with a lateral margin widest anteriorly, a transverse marking on the lateral posterior margin, and a prominent dorsal triangle at the posterior margin; fifth with a narrow lateral margin, and a dorsal vitta widest anteriorly; venter black; second segment yellow, with two elongate spots along the anterior margin; third, fourth and fifth with a narrow lateral and posterior margin of yellow. Femora red, with a wide preapical band of brownish black; tips of femora and the basal half of the tibiæ yellow, outer half of the tibiæ and tarsi red. Wings brownish, hyaline; veins red.

♂.—Face wholly black; the small dorsal triangle on the third segment and the greater amount of yellow on the scutellum distinguishes it from *S. normula*. Femora brownish black; in some specimens showing a preapical band of black on the middle and posterior femora, tibiæ and tarsi reddish yellow.

Philadelphia, Pa.; Agricultural College, Mich., June 20 (Davis); Elkhart, Ind. (J. R. Weith); Algonquin, Ill., June 1 (Dr. Nason); Burlington, Iowa (Dr. H. G. Griffith); Sand Hills, Neb., July (Univ. Neb.); Allegheny, Pa. (Aldrich).

Stratiomyia unilimbata Loew (Pl. iii, figs. 19, 20).*Stratiomyia unilimbata* Loew, Centur. vi, 6.

Length ♂ ♀ 13 mm. ♂.—Face, frontal and vertical triangle black; face with long white pile. Antennæ black, under side of the third joint brownish. Thorax black, with a whitish pile, which is longest on the pleuræ; scutellum and spines yellow, base black. Abdomen black, with the following yellow markings on the segments: second with a large lateral triangle; third with a small subtriangular spot at the anterior angles, a transverse marking at the lateral posterior margin, and a very small dorsal triangle at the posterior margin; fourth with lateral and posterior margins, the latter with a small dorsal projection; fifth with a slight lateral margin towards the anterior angles, and a subtriangular dorsal mark not reaching anterior margin; venter black, segments with yellow posterior margins, widest on the second segment, where the black is widely interrupted. Femora black, tips of the femora, basal half of the tibiæ and the tarsi, yellow; outer half of the tibiæ, the last two and tips of the other tarsal joints blackish; the outer half of the posterior tibiæ is normally brownish, with a medial ring of black. Wings brownish hyaline; veins reddish.

♀.—Face, front, vertex and occiput black; pile on the face whitish, thickest along the orbits; front with a small, yellow, subcordate spot below the ocelli; lower part of the occiput, an obscure greenish yellow. Thorax black, with short

yellowish white tomentum; scutellum yellow, the black base narrower than in the male. Abdominal markings the same as the male, except that markings on the second segment are usually contiguous at the posterior angles.

In a male specimen in the U. S. National Museum the marking on the posterior margins of the third segment are contiguous, forming a margin similar to that on the fourth. A female from Illinois has the markings on the posterior margin of the third contiguous and widely interrupted on the fourth.

Montana (Morrison, Univ. Kans.); Wisconsin (Loew); Brookings, S. D. (Aldrich); Custer, S. D.; War Bonnet Canyon; Lincoln, August; and West Pt., Neb. (Univ. Neb.); Cheyenne, Wyoming, June 15 (collection C. V. Riley); Spanish Peak, Col. (Osten Sacken), Mus. Comp. Zool.; Carlinville, Ill. (Robertson).

Stratiomyia senaria Loew (Pl. iii, fig. 10).

Stratiomyia senaria Loew, Centur. vi, 7.

Length 11 mm.; wing 9 mm. ♀.—Face, front and upper part of the occiput black, with whitish tomentum; a yellow spot below the ocelli, facial orbits and lower part of the occiput, dull yellow. Antennæ black. Thorax black, with yellowish white tomentum; scutellum yellow, with a narrow black base, spines red. Abdomen black; second, third and fourth segments with transverse yellow markings along the lateral posterior margins, those on the fourth short and narrow, third with a small yellow spot at the anterior angles; fourth laterally margined with yellow; fifth with a narrow lateral margin and a central stripe not reaching the anterior margin; one specimen shows a short, obsolete, central stripe on the fourth; venter black, second segment broadly margined with yellow, or yellow with black maculations on the lateral anterior margins; third, fourth and fifth with a narrow posterior margin of yellow. Femora black, tips of the femora, tibiæ and tarsi yellow; in one specimen the anterior and middle tibiæ are annulated with brown in the middle, and the outer half of the posterior tibiæ is brown. Wings of a uniform dark brown.

Two specimens, St. Augustine, Fla.

In the type, a ♂, the markings on the second segment are somewhat triangular, and those on the third and fourth nearly of equal size.

Stratiomyia nevadæ Bigot.

Stratiomys nevadæ Bigot, Ann. Soc. Ent. France, xxxviii, 24.

Long. 10 mill. ♂.—Nigra, facie, thorace scutelloque longe et dense cinereo villosis; abdomen nigro piloso; halteribus fuscis, clava prasina; spinis scutelli pallide testaceis, apice fuscis; tibiis basi, late fere albis, tarsis fulvo notatis, apice infuscatis; alis pallidissime flavis, macula stigmatali pallide castanea.

Entièrement noire, excepté: cotés de la face, thorax, écusson, longuement et assez densément couverts de poils gris; abdomen avec des poils noirs et courts; épines de l'écusson blanchâtres, à pointe brune; balanciers roussâtres avec la massue d'un vert clair; base des tibias largement blanchâtre, tarses roussâtres avec l'extrémité brunâtre; ailes un peu roussâtres ainsi que le stigmat.

Amer. Septentr. (Nevada); one specimen.

The following description I refer to this species, a study of the type is necessary for certainty:

Length ♂ 11 mm.—Face black, with long, dense, whitish pubescence. Antennæ black. Thorax and scutellum black, with long whitish pile; spines of the scutellum yellow; halteres bright green. Abdomen black, shining; pile black; venter black, segments with a narrow posterior margin of yellow. Legs black; tips of the femora, basal half of the tibiæ and two basal joints of the tarsi, yellow; the remaining joints of the tarsi brownish. Wings hyaline, veins brown.

Two specimens, Weber Lake, California, July 25 (Osten Sacken), Museum of Comparative Zoology, Cambridge, Mass.

This species may be readily known by its uniform black color, and conspicuous whitish pile. This species is included by Baron Osten Sacken in the following remark in *Western Diptera*, p. 213: "I have furthermore three *Stratiomyiæ* and one *Odontomyiæ* from the Sierra Nevada (Weber Lake, in July) which I abstain from describing."

***Stratiomyia Meigenii* Wiedemann (Pl. iii, figs. 21, 22).**

Stratiomys Meigenii Wied., Auss. Zw. ii, 61, 2 (tab. viii, fig. 7).

? *Stratiomys lineolata* Macquart, Dipt. Exot. 4e Suppl. 48, 6 (tab. iii, fig. 5).

Stratiomyia angularis Loew, Centur. vi, 16.

Stratiomyia marginalis Loew, Centur. vi, 17.

Length ♂ ♀ 11 13 mm. ♂.—Face black, with whitish pile. Antennæ black. Thorax black, whitish pile, longest and thickest on the pleura: scutellum black, apical margin (between the spines) greenish yellow, spines dark yellow, the tips more or less brownish, the size of the apical margin varies from a narrow line to an area about one-fifth the size of the scutellum. Abdomen black, with short black and whitish pubescence, and marked with yellow as follows: second segment with triangular lateral markings narrowly reaching the anterior angles; in some specimens these markings are truncated or divided anteriorly, leaving subtriangular or oblong transverse markings at the posterior angles, and very small markings on the anterior angles; lateral margins of the third segment expanding into triangles at the anterior angles, and connected at the posterior angles with the transverse markings on the lateral posterior margins; markings on the fourth the same as those on the third, except that the transverse markings are much shorter and narrower; the form of the lateral margins varies, in one specimen the lateral and transverse markings on the third and fourth segments are of uniform width; fifth with lateral margins and an even dorsal line not reaching the anterior margin; venter yellow or greenish yellow; second segment with an oblong black spot on each side along the anterior margin, sometimes narrowly connected; third, fourth and fifth with a transverse central spot, usually attenuated along the anterior margin, but not reaching the lateral edge; the maculations vary considerably, and in one specimen are almost obsolete. Femora black, outer two-thirds of the anterior and middle tibiæ black or brownish black, posterior tibiæ reddish, annulated in the middle with brown; in some specimens this

character also prevails on the middle tibiae; tips of the femora, base of the tibiae and tarsi yellow, tarsal joints annulated with red at the tips. Wings brown, veins red, tips more or less a clear hyaline.

♀.—Face, front and vertex black, whitish pile longest and thickest on the face, front shining, a spot on the facial orbits, a small subcordate spot below the ocelli and the lower part of the occiput yellow; in some specimens there is also a very small spot on each side of the ocelli. Thorax black, with black and whitish tomentum, arranged so as to form a broad dorsal and transverse line and a postalar spot of black. Abdomen black, with short whitish pubescence; the yellow markings on the second, third and fourth segments consists of a small subtriangular at the anterior angles, a narrow lateral margin more or less distinct, and narrow transverse markings at the lateral posterior margin, fifth with a lateral margin widest anteriorly, and a dorsal stripe not reaching the anterior margin; venter greenish yellow, with black markings similar to those of the male, but usually larger, leaving only a narrow lateral and posterior margin of yellow.

Over forty specimens; southeastern Pennsylvania and southern New Jersey; common July 5 to August 16; West Pt., Neb., June (Aldrich); Riley County, Kansas, June (Marlatt); Blanco County, Texas; Agricultural College, Michigan, June 20 (Davis); Algonquin, Ill., June 4 (Dr. Nason).

Loew's descriptions were based on single specimens; with a large series it would have been impossible to separate them. The type of *S. angularis* differs from *S. marginalis* in having more prominent yellow triangles at the anterior angles of the segments, and *S. nigri-ventris* in having a greater amount of black on the ventral segments. The specimen referred to, *S. Meigenii*, has the yellow spot on the front, and the yellow of the scutellum prominent. Wiedemann describes a ♂, but the head in the figure is that of a ♀. In the figure the abdomen shows only four segments, or at least the color markings indicate only four, while the vittæ on the fifth segment extends from the anterior margin and does not reach the posterior; the latter is the reverse in all our *Stratiomyia*, so that the figure should be considered incorrect.

Stratiomyia apicula Loew, (Pl. iii, figs. 23, 24).

Stratiomyia apicula Loew, Centur. vi, 13.

Length ♂ ♀ 12 mm. ♂.—Face, frontal and vertical triangles black; pile on the face white; facial orbits slightly yellowish. Antennæ black, underside of the third and tip of the second joint brown. Thorax black, with yellowish white pile; scutellum black, apical margin and spines yellow. Abdomen black, with short whitish pubescence, and with the following yellow marking on each of the segments: a small lateral spot on the first, a large subquadrate marking at the sides of the second; third with a wide lateral posterior margin of about equal extent; fourth with a lateral margin, widest anteriorly and slightly extending

onto the lateral posterior margin; fifth with narrow lateral margins, and a central triangle attenuated anteriorly, but not quite reaching the anterior margin; venter black; segments with yellow posterior margins, widest on the second segment, where the black consists of two large spots along the anterior margin. Femora black, outer half of the anterior and middle, and a medial band on the posterior tibiae brownish black: tip of the femora, basal half of the anterior and middle tibiae, posterior tibiae and all the tarsi yellowish. Wings brown, hyaline; veins reddish.

♀.—Face, front, vertex and upper portion of the occiput, black; face with whitish tomentum; facial orbits, a small subcordate spot below the ocelli, and the lower portions of the occiput, greenish yellow. Thorax black, with yellowish tomentum; scutellum black; apical margin and species yellow. Abdominal markings the same as the male, except that the markings on the side of the second segment are more quadrate.

Burlington, Iowa (Dr. H. G. Griffith); Algonquin, Ill., June 8–19 (Dr. Nason); Douglas County, Kansas, June (Univ. Kans.); War Bonnet Canyon and Lincoln, Neb. (Univ. Neb.).

***Stratiomyia discalis* Loew (Pl. iii, figs. 27, 28).**

Stratiomyia discalis Loew, Centur. vi, 14.

Length ♂ ♀ 14 mm. ♂.—Face, frontal and vertical triangle black; pile long, yellowish. Antennae black. Thorax black, with long, dense, yellowish pile; scutellum black, with long pile; apical margin and spine yellow. Abdomen black, shining; thick and very convex; pile on the first, second and fifth segments yellowish; on the third and fourth black; a small spot at the posterior angles of the first, a large quadrate marking on the sides of the second; a triangular mark at the anterior angles of the third, and a dorsal line on the fifth, yellow; first, fourth and fifth ventral segments black, with narrow lateral and posterior margins; second and third yellow, with a narrow posterior margin of black on the second, and two black spots on the posterior margin of the third; pile on the entire ventral surface yellow. Femora and tibiae black, or brownish black; tip of the femora, basal third of the tibiae, yellowish; basal half of the posterior femora and the tarsi brownish. Wings brown, hyaline.

♀.—Face, front, vertex and occiput black; face with thick yellowish pubescence, sparse on the front and vertex; facial orbits and a small cordate spot below the ocelli yellow. Antennae black, proboscis brownish. Thorax black, with a dense yellowish tomentum; scutellum black, apex and spines yellow. Abdomen black, shining, with a very short whitish pubescence; a subtriangular mark on the sides of the second, a small triangular mark at the anterior angle of the third, a very narrow lateral margin on the fourth and fifth, and a dorsal line on the fifth, yellow; venter same as the male; posterior tibiae, tarsi (except the tips) and basal half of the femora, yellow.

Provo, Utah (Wickham); West Point, Neb., May (Aldrich); Minnesota (Univ. Kans.); Algonquin, Ill. (Dr. Nason); Pennsylvania (Philip Nell); Agricultural College, Michigan (Lowe); West Virginia and Massachusetts, June (Riley); Spanish Peak, Col. (Museum Comparative Zoology).

Stratiomyia quaternaria Loew (Pl. iii, figs. 25, 26).*Stratiomyia quaternaria* Loew, Centur. vi, 12.

Length ♂ ♀ 11 mm.; wing 9 mm. ♂.—Face black, whitish pile. Antennæ black, brownish on the underside of the third joint. Thorax black, with long, brown, reddish pile, not quite as wide as the head; scutellum black; apical margin and spines yellow. Abdomen black, with black and yellowish pile, and marked with yellow as follows: a large, square, lateral marking on the second; a large lateral marking on the third, nearly as wide as that on the second, but not touching the anterior margin its full width, and with an indentation on the inner edge near the posterior margin; fourth with a lateral margin widest anteriorly, or with a small triangle at the anterior angles; fifth with a very narrow or obsolete lateral margin, and a medial line not reaching the anterior margin; venter yellow, second segment with two elongated black spots along the anterior margin, midway between the centre and lateral margin; third with a central black square of greater or less extent, sometimes consisting only of an anterior marginal line; fourth black, with a wide lateral and narrow posterior margin (in one specimen a narrow medial line); fifth black, with a narrow lateral and posterior margin. Abdomen wider than the female, sides of the second, third and fourth almost parallel. Femora black, tip of the femora, base of the tibiæ and posterior tarsi yellow; outer half of the anterior and middle tibiæ dark brown, posterior tibiæ annulated with brown in the middle; tarsi reddish brown. Wings brown, hyaline; veins red, discal cell emits three veins.

♀.—Face, front and vertex black; whitish pile, a small spot below the ocelli, and one on each side of the face yellow; the yellow markings on the second abdominal segment the same as in the male; on the third segment the same as the male, or much smaller, and consisting of a subtriangular spot at the anterior angle and a narrow margin at the posterior angle; the form of the yellow markings on the third segment is the most variable character.

Allegheny, June 7, and Northumberland County, Pennsylvania (Aldrich); Agricultural College, Michigan, June 16 (Davis); Algonquin, Ill., June 4 (Dr. Nason); Denver, Col. (Beales).

Stratiomyia maculosa Loew (Pl. iii, figs. 13, 14, 15).*Stratiomyia maculosa* Loew, Centur. vii, 19, ♀.*Stratiomyia insignis* Loew, Centur. x, 7, ♂.*Stratiomys dentata* Bigot, ♀ Ann. Soc. Ent. France, xvi, 1879, 210.*Stratiomys lacerata* Bigot, ♂ Ann. Soc. Ent. France, xvi, 1879, 211.

Length ♂ ♀ 14 mm. ♂.—Face black, with yellowish white pile; occiput narrowly margined with yellow. Antennæ black. Thorax black, with long, dense, yellow pile; scutellum yellow, base black. Abdomen black, with yellow pubescence, and marked with yellow as follows: the large lateral spots do not reach the anterior margin, except near the angles; second segment with a large subtriangular lateral spot; third with a large, square, lateral spot, which contains, near the lateral margin, a small, oblique, black spot; in one specimen this spot is wanting, and there is a small dorsal triangle at the posterior margin; in this specimen the square markings on the fourth segment contain a small oblique black spot, and the yellow on the posterior margin is continuous. In the first specimen (fourth segment) the spot is connected with the black, thus forming an incisure into the square, yellow, lateral spot; yellow not continuous on the pos

terior margin, and only a small dorsal triangle; fifth with a lateral margin, widest anteriorly, and a dorsal line. In specimen referred to there is a round spot on each side of the dorsal line; venter yellow, with a central row of large black maculations; laterally attenuated along the anterior margin, but not reaching the lateral or posterior edges: in some specimens the black on the second segment consists only of an irregular line; the ventral markings are quite constant in both sexes.

♀.—Face, front and occiput, yellow; oral margin, cheeks and medial facial line (more or less distinct) a transverse line from the base of the antennæ to the eyes and the vertex, black; in some specimens the two latter are narrowly connected at the sides; vertical angle with two yellow spots, sometimes connected on the cervex. Thorax black, with yellowish tomentum; scutellum wholly yellow. Abdomen black; the variable yellow markings might be described from three specimens, as follows: *First*.—The square lateral markings on the second segment with a small lateral spot of black; the square lateral markings on the third and fourth with a broad oblique incisure of black; a small triangle on the posterior margin of the second, a larger one on the third, and the one on the fourth much larger and greatly attenuated, but not reaching the anterior margin; the yellow markings not connected at the posterior margin; fifth with a dorsal line, on the sides of which are spots narrowly connected, but not connected with the lateral margins. *Second*.—The square lateral markings on the second segment without the small black spots; lateral markings on the third and fourth with oblique black spots; second segment with a small dorsal triangle, third with a larger triangle; fourth with a much larger and attenuated triangle, not reaching the anterior margin, the yellow markings connected at the posterior margin; fifth with a dorsal line, on each side of which is a spot narrowly connected with the dorsal line and lateral margin. *Third*.—The square lateral markings on the second segment with small black spots and a prominent dorsal triangle; lateral squares on the third with black spots and a larger dorsal triangle; fourth segment yellow, except a narrow anterior margin, the lateral spots and two minute points on the posterior margin of black; the markings on the fifth segment might be described as a broad dorsal line, with a spot on each side broadly connected with the dorsal line and lateral margins, or yellow, with a narrow anterior margin, and subtriangular markings at the posterior angles, of black. Femora black; tips of the femora, tibiæ and tarsi, reddish yellow; middle of the tibiæ obscurely annulated with brown, most prominent on the posterior tibiæ. Wings brownish, veins dark yellow.

Alameda County, California (Coquillett); San Rafael County, California, April and May (Osten Sacken); Ogden, Utah (Riley), U. S. National Museum.

The above description is based on four males and four females. The great variation in color is remarkable, in comparison with other North American species. The black face and base of scutellum of the male led Loew to describe it as another species. Baron Osten Sacken, in *Western Diptera*, p. 213, refers to the two species *S. maculosa* and *S. insignis* as being identical.

Stratiomyia badius Walker (Pl. iii, figs. 11, 12).*Stratiomys Badius* Walker, List, iii, 529, l. c. iv, 1157.*Stratiomys ischiaca* (Harris), Walker, List, iii, 529.*Stratiomyia picipes* Loew, Centur. vii, 21.

Length ♂ ♀ 14 mm. ♂.—Face and lower portion of the occiput yellow; face with long yellow pile; a wide facial line, mouth, vertical triangle and upper part of the occiput black. Antennæ black. Thorax black, with brownish pile; scutellum yellow, base black; apical margin and spines red. Abdomen marked with yellow, as follows: second segment with a small spot at the anterior angles, and a transverse marking on the lateral posterior margins; those on the third segment similar, except that the markings on the lateral posterior angles are longer, and in some specimens almost join; fourth with a spot at the anterior angle, and a continuous posterior margin, from which extends, anteriorly (for about two-thirds the length of the segment), a medial stripe widest at the base; the fifth with a very narrow lateral margin and a medial stripe not reaching the anterior margin; venter black, with lateral spots on the first and a quite uniform posterior margin of yellow to all the other segments. Femora black, varied with brown; basal third of the tibiæ yellow; tips of the femora, tibiæ and tarsi, red. Wings brownish, hyaline; veins reddish.

♀.—Vertical portions of the occiput, vertex, front, facial line and mouth black. Face, two large spots on the front, two on the vertical angles and lower part of the occiput yellow; pile on the thorax shorter than in the ♂ and with somewhat conspicuous whitish tufts at the humeri, suture, posterior angles and pleuræ; yellow of the scutellum more prominent. Femora red, with a wide, variable band of brownish black.

Franconia and Mt. Washington, N. H. (Mrs. Slosson); Massachusetts (Harris); "English River, Kennicot; Canada, Couper" (Loew).

Walker's name having priority, I have adopted instead of Loew's. In describing the species Walker gave the habitat as "New Holland." This he corrects in List, pt. iv, p. 1157, as follows: "for New Holland read New Hampshire, and unite the description of *S. Badius* with that of *S. ischiaca*." The latter name first appeared in "Harris' Catalogue Insects of Massachusetts," 1835 (name only).

Stratiomyia mutabilis Fabricius (Pl. iv, fig. 3).

Stratiomys mutabilis Fabr., Ent. Syst. iv, 262; Syst. Antl., 81; Wiedemann, Auss. Zw. ii, 63, tab. 8, figs. a-d; Perty, Del. Anim., etc., tab. 38, 14; Bellardi, Saggio, etc., i, 30; Schiner, Novara, etc., 61.

Stratiomys fasciata Fabr., Ent. Syst. iv, 266; Syst. Antl. 81, [Bellardi].

Length ♂ ♀ 9 mm.—Face black, with white pile, which is very long and thick on the inferior orbits; facial prominence shining; facial orbits, and a spot on each side of the prominence near the base of the antennæ, yellow. Antennæ black, basal half of the first joint reddish. Thorax black, with thick whitish pile; posterior angles yellow; scutellum black, inferior margin, basal angles and spines, yellow; tips black. Abdomen black, with a dense pubescence, which, in certain lights, show a silvery reflection (more noticeable on the ventral surface), segments narrowly margined with yellow; a band occupying the posterior two-

thirds of the fourth, and one occupying the medial third of the fifth segment yellow; venter yellow; all the segments with a basal band of black, the first segment also has a posterior band. Femora brownish black; tibiae and tarsi reddish, terminal half of the tarsi brownish; anterior half of the wings yellowish, the outer portion of this with a brownish tinge.

♀.—Face and front black, with yellowish white pile; facial and frontal orbits, two spots above, and two below the base of the antennæ and occiput, yellow. Thorax black, pubescence yellow; humeri, a narrow, raised, lateral line that divides the dorsum from the pleuræ, and the posterior angles yellow; scutellum and spines yellow, discal portion of the scutellum and tips of spines, brown.

Orizaba, Mex. (Prof. Bruner); Tehuantepec (collection C. V. Riley, U. S. National Museum); Panama (Mus. Comp. Zool.); San Geronimo, Guatemala (Champion); 6000 to 7000 feet Irazu Costa Rica (Rogers); Cayenne; Brazil.

Stratiomyia constans Loew (Pl. iv, figs. 1, 2).

Stratiomyia constans Loew, Centur. x, 8.

Length ♂ ♀ 9 mm.; wings 7 mm. ♂.—Face black, with silvery white pile; a small spot on each side of the facial protuberance, a spot on the orbits and the lower part of the occiput yellow; oral margin more or less brownish; proboscis black, base brown, first and second joints of the antennæ red, tips of the first and the third joints black. Thorax black, whitish pubescence; pleuræ and pectus with silvery white pile; humeri, a spot forward of the suture and the posterior angle, yellow; pleuræ with an irregular spot on the prothorax, a smaller one on the mesothorax and metathorax, yellow; scutellum yellow; spines red. Abdomen black, with whitish pubescence (silvery in certain lights), and marked with yellow, as follows: second segment with subtriangular markings at the lateral posterior angle; third with a wide posterior band (in one specimen narrowly interrupted); fourth with a narrow posterior band (which is broadly interrupted in one specimen); all the segments with a narrow lateral margin; venter greenish yellow, with silvery white pubescence; first segment with two spots and a narrow posterior margin of black; second, third, fourth and fifth, with an anterior band of black, laterally attenuated, but not quite reaching the lateral margin; the band on the second segment is usually interrupted. Legs uniform red; anterior third of the wing dark brown; veins reddish, the remainder of the wing brownish hyaline.

♀.—Face, front, vertex and occiput yellow; with yellowish pubescence; oral margin and a line extending from there to the orbits brownish black; base of the antennæ surrounded by black, from which extends a central line to the facial prominence, and one on each side midway between the facial line and the orbits; narrowly connected above with the square black marking on the front and vertex; vertical orbits brownish, and connected with the black of the vertex. Thorax black; humeri, a lateral stripe extending to the suture; posterior angle, scutellum and pleuræ, yellow; the lateral stripe and pleuræ narrowly divided by a prominent dorso-pleural suture; the posterior margin of the third and fourth segments continuous; prominent and of uniform width.

Blanco County, Texas.

Stratiomyia Gerstaeckeri Bellardi.*Stratiomys Gerstaeckeri* Bellardi, Saggio, etc., i, 31, tab. 1, fig. 10.

♂.—Black, with greenish stripes. Head broad, eyes naked and contiguous near base of front, ocelli yellow, front triangular, black, with yellowish pubescence. Antennæ long, black, base of the first yellowish, face very prominent, black shining; pubescence whitish, with two yellow spots near the orbits, the upper one near the base of the antennæ the lower one on the inferior orbits; apex of the epistoma marked with yellow; palpi yellow, proboscis black. Thorax subquadrate, black, pubescence yellow, posterior with two greenish markings; pleuræ and pectus with whitish pile; scutellum black, spines yellow, halteres green, base brown. Abdomen subquadrate, depressed, black, somewhat naked, pile yellow, obsolete, margins greenish yellow, second and third with a band at the posterior margin band small and not interrupted; venter green tomentose, silvery. Legs brownish black; femora very black, tibiæ and tarsi obscure yellow; apex of the tarsi brown. Wing, anterior margin broadly, densely fuscous, posterior margin hyaline. Length 7 mm.; wings 18 mm.

Mexico (Sallé), Bellardi.

This species, on first appearance, seems related to *Stratiomyia subalba* Walker, but the bands on the second and third segments are not interrupted.

Stratiomyia bimaculata Bellardi.*Stratiomys bimaculata* Bellardi, Saggio, etc., App. 10, fig. 7.

♂.—Black, with two whitish spots. Head broad, eyes near the base of the front contiguous; front small, triangular, black, below with yellowish silvery pubescence, above with black pubescence. Antennæ very long, black; base of the first joint yellowish, face prominent, middle longitudinally carinate, black, shining with thin whitish pubescence; palpi brown, near apex yellow, proboscis black. Thorax subquadrate, slightly convex, black; tomentose somewhat dense and yellowish brown, a green spot between the base of the wing and scutellum; scutellum black, spines short, black, and near the apex, yellowish; pleuræ and pectus black, with whitish pubescence; halteres green, near the base yellow. Abdomen subquadrate, depressed, black, tomentose brown; second segment with two large, greenish white spots, contiguous with the posterior margins of the segments and curved anteriorly, middle stripe small; venter white, silvery tomentose. Legs brownish black, all of the femora black; tibiæ and tarsi reddish yellow. Wings small, rather long, anterior broadly stained with black, near the posterior margin clouded. Length 11 mm.; wings 20 mm.

Cosamaloapam, Mexico (Sallé), Bellardi.

*Doubtful and Undetermined Species.***Stratiomyia constricta** Walker.*Stratiomys constricta* Walker, Trans. Ent. Soc. n. ser. v, 268.

♂.—Deep black. Head with slightly silvery tomentum in front and with gray pubescence beneath and behind; scutellum with two piceous spines. Abdomen piceous at the tip, and with a band of slightly silvery tomentum on each segment; tarsi and hind tibiæ tawny. Wing lurid at base, dark brown from thence to more than half the length, vitreous and colorless toward the tip. Length 6 lin.; wings 12 lin.

Mexico.

Stratiomyia pinguis Walker.

Stratiomys pinguis Walker. Trans. Ent. Soc. n. ser. v, 270.

♀.—Blackish. Head with ferruginous tomentum above with whitish pubescence in front; hind side with silvery tomentum. Antennæ black; third joint lanceolate towards the tip, much longer than the first. Thorax with ferruginous tomentum and with ferruginous stripe along each side; scutellum with two ferruginous spines. Abdomen with bands of slightly gilded tomentum on the borders of each segment; underside with bands of whitish tomentum, which are dilated on each side, and with a broad, tawny, discal stripe. Femora and tibiæ beneath and tarsi, tawny. Wings vitreous, lurid along the costal from the base to nearly two-thirds its length. Length 6 lin.; wing 12 lin.

Mexico.

Stratiomyia subalba Walker.

Stratiomys subalba Walker, List, etc., v, 43.

? *Stratiomys subalba* Bellardi, Saggio, etc., i, 31; Osten Sacken, Biol. Cent.-Amer. Dipt. 36.

“Male.—Black, clothed beneath with silvery down. Antennæ nearly twice the length of the head; first joint tawny towards the base, nearly six times the length of the second; flagellum elongate-fusiform; scutellum tawny along the hind border, with two testaceous spines. Abdomen with two interrupted whitish bands, one on the second, the other on the third segment; underside pale green, with silvery tomentum. Legs tawny; femora black. Wings limpid, narrow, dark brown in front; halteres white. Length of body 3 lines; wing 6 lines.

“Para. From Mr. Bates’ collection (Walker).”

“Male.—Black, vittæ white. Head broad, eyes near the base of the front contiguous; front small, triangular, black, with yellow pile. Antennæ long, black; first joint yellow, near the apex black; face prominent, carinate, black, shining, with sparse white pile; palpis flavis; proboscis black. Thorax subquadrate, black, tomentum rather long, yellow, a pale spot between the base of the scutellum and base of the wing; scutellum black, bispinose; spines yellow, short; pleuræ and pectus black, with white pile; halteres yellow, knob green. Abdomen subquadrate, black; second and third vittæ near the posterior margin; vittæ rather broad, interrupted in the middle, white; lateral margin of the second, third and fourth segments yellowish; venter yellow, with silvery tomentum. Legs black and yellow; femora black; tibiæ and tarsi yellow. Wings yellowish, towards the posterior margin broadly hyaline, and the anterior margin fuscous. Length 8 mm.; length of wings 16 mm.”

Tampico, Mex. (de Saussure). *Bellardi* Baron Osten Sacken (Biol. Centr.-Amer. Dipt. 36) refers to this species as follows:

“I cannot believe that this species is merely a variety of *S. mutabile*, besides the very considerable difference in the coloring of the body and wings (the costal half of which is uniformly brown). The abdomen is squarer and flatter than in the male of that insect. Schiner (Reise d. Novara Dipt. p. 61) speaks of varieties of *S. mutabilis* with the costal half of the wing uniformly brown; and Arri-

balzaga (Catalogue, etc., p. 128) regards *S. subalba* Walker as a mere variety of *S. mutabilis*. But is Schiner right? and is *S. subalba* Arrib. the same as *S. subalba* Bell.? meanwhile I cannot believe, until we have proof of the contrary, that the four male specimens before me are a mere variety of *S. mutabilis*."

I have not seen this species.

Stratiomyia goniphora Say.

Stratiomys goniphora Say, Jour. Acad. Nat. Sci. Phila., vi. 161; Compl. Wr. ii, 356.

"Black. Thorax with minute golden hairs; beneath greenish. Head yellowish white, two undulated, black, frontal bands; vertex black, yellowish behind; hypostoma with a lateral black dot, sometimes obsolete; proboscis black. Antennæ black, occiput black. Thorax with numerous small golden hairs; a yellowish line over the wings; scutellum black, posterior margin and spines yellow. Wings hyaline, costal nervures and cellule yellowish; middle nervures blackish, tergum black, with lateral yellow triangles and tip; beneath pale greenish, pectus on the disc black; feet yellowish, a line between the thighs black; venter on the posterior disc ferruginous (Say). Length more than three-tenths of an inch.

"Inhabits Mexico."

Stratiomyia robusta Walker.

Stratiomys robusta Walker, List, v, 37.

Nigra: oculi testaceo ex parte marginati; antennæ capite duplo longiores; scutellum margine postico spinisque flavis; abdomen crassum, marginibus vitta apicali ventrequæ flavis, hac fasciis tribus abbreviatis nigris; pedes flavi, femoribus nigris, tibiis nigro cinctis; alæ fuscæ, apice limpidæ; halteres flavi.

Fem.—Black. Head testaceous about part of the eyes. Antennæ about twice the length of the head; first joint full six times the length of the second. Thorax clothed with pale down; hind border and spines of the scutellum yellow. Abdomen convex, very thick, yellow along the sides, and with a yellow stripe on the apical segment; underside yellow, with three broad, black bands, which are much abbreviated on each side. Legs yellow; femora black; a black band on each tibia. Wings brown, with limpid tips; veins piceous; halteres yellow. Length of the body 5 lines; wings 10 lines.

North America (Walker).

Stratiomyia nigrifrons Walker.

Stratiomys nigrifrons Walker, List, iii, 531.

"Mas.—Nigra; scutelli margine postice flavo, abdominis lateribus maculisque ad apicem duabus flavis, ventris fasciis flavis, antennis pedibusque nigris, tibiis apice tarqu fulvis, alis fuscis.

"Body black. Head as broad as the chest, clothed with tawny hairs; eyes black; a small part on each side composed of very small facets; mouth and feelers black; chest and breast clothed with dark tawny hairs; hind border of the scutcheon yellow, armed with two tawny spines. Abdomen nearly oval, a little broader and longer than the chest, thinly clothed with short tawny hairs, yellow on each side, and adorned with a yellow spot on each of the last two segments;

hind border of each segment on the underside adorned with a yellow stripe, which is widened in the middle. Legs black, clothed with short tawny hairs; shanks tawny towards the base; feet tawny; hind shanks tawny, with two black bands. Wings brown, wing-ribs piceous; veins ferruginous; poisers tawny, with apple-green knobs.

"Fem.—All the facets of the eyes very small; hind border of scutcheon tawny; sides and hind borders of the segments of the abdomen tawny, its upper side also adorned with a short tawny stripe at the tip, and a large tawny spot on each side of the base; feet piceous above; claws black, tawny at the base; knobs of poisers tawny. Length of the body 6-6.5 lines; wings 10-11 lines (Walker).

St. Martin's Falls, Albany River, Hudson's Bay.

Stratiomyia simplex Bigot.

Stratiomys simplex Bigot, Ann. Soc. Ent. France, xxxvii, 24.

"♀. Long. 8 mill.

"Nigra; facie, fronte, thorace, scutello, parce cinereo-flavido villosis et tomento flavido intermixto; spinis scutelli testaceis, apice fuscis; halteribus testaceis, clava prasina; abdomine fere nudo, flavido anguste circumdato, segmentis 2, 3 et 4^{is}. utrinque, apice, vitta flavida, angusta, notatis, ventre prasino flavescente; femoribus nigris, albido tomentosus, tibiis, fusco annulatis, fulvis, tarsis fuscis, basi late fulvis; alis fere hyalinis, macula stigmatali fulva, venis fulvo pallido limbatis. Antennarum segmento 1^o abbreviato."

"Noire. Face, front, thorax, écusson, couverts d'une villosité gris jaunâtre, mélangée d'un fin duvet squammeux également jaunâtre, flancs à poils gris; épines de l'écusson testacées, à pointe brune; balanciers testacés, à massue verte; abdomen à peu près nu, finement bordé de fauve, 2^e, 3^e et 4^e segments avec, de chaque coté de l'extrémité une demibande étroite, jaune, ventre d'un jaune verdâtre; cuisses noire, à duvet blanchâtre, genoux et tibias fauves, ainsi que la base de tous les segments tarsiens, un anneau brun, étroit, sis vers le milieu des tibias. Premier segment des antennes relativement court.

"Texas, Colorado, 3 spécim."

ODONTOMYIA.

Odontomyia Meigen Klassific., etc., i, 128, 1804.

Stratiomys in part, of early authors.

Rather large, color variable, green or yellow with black markings, or black, with green and yellow markings. Males and females, as a rule, vary considerably in appearance. Head hemispherical, eyes of the male contiguous, but broadly separated in the female; ocelli prominent, face rounded or somewhat prominent and slightly carinate. Antennæ inserted near the middle of the head, variable; first joint less than three times the length of the second, third longer than the first and second together, more or less tapering, without style or bristle, and composed of five annuli. Thorax subquadrate and pilose in the male, quadrate and tomentose in the female; scutellum prominent, with two spines. Abdomen ovate, flattened, and

but slightly convex, with five visible segments. Legs of moderate size, tibiæ without spurs. Wings clear hyaline, veins yellowish, anterior veins crowded, third longitudinal vein branched in the more typical forms, and from the discal cell emits three equal or unequal veins, sometimes the lower veins that arises from the discal cell (fourth longitudinal vein) is faint or rudimentary, and the third and fourth posterior cells are coalescent, but in such cases the discal cell will usually show an angulation indicating its origin.

Type of the genus *O. ornata* Meigen, of Europe.

In the species placed in this genus there is a greater variation to contend with than in the genus *Stratiomyia*. In the first or leading character, which distinguishes this from the preceding, viz., "first joint of the antennæ less than three times the length of the second;" there is a gradual lengthening of the first joint from less than twice the length of the second until the full limit is reached, as in *O. flavicornis* and *O. occipitalis*. In the latter the third longitudinal vein is simple, but this character is not confined to those with an unusual long first antennal joint, but is characteristic of a number with normal antennæ. Again, in the case of *O. flavicornis* and *O. occipitalis*, which have the same alar and antennal characters; the eyes of the male of the former are pubescent, while the latter are glabrous. Rondani founded the genus *Psellidotus* on "eyes hairy, type *O. elegans* vel *cruciata* Macq." A male specimen of *O. elegans* before me shows that the first and second joint of the antennæ are subequal, and the third longitudinal vein is branched. In *O. viridis* Bellardi and *O. obscura* Oliv. the eyes of both the male and female are pubescent, third longitudinal vein branched in the former, and in the latter simple.

Another genus to which some of the species have been referred is *Exchostoma* Macq.; type *E. nitida* Macq. of southern Europe. I have been unable to make any of our species agree satisfactorily with this genus. Bigot's *Exchostoma caliceps* I have referred to Loew's *O. nigrirostris*. Dr. Williston's says "Bigot's species is in any event an *Odontomyia*."

A universal study of this and allied genera may prove the necessity of placing some of our species in other genera; but until this is done, and we have a better knowledge of the American species, such a course would be unadvisable. Some of my determinations may eventually prove to be in error, but I have honestly endeavored to straighten out this neglected group in the hope of furthering an in-

terest in their study. The following table contains only those species found north of Mexico :

- 1.—Third longitudinal vein branched.....2.
Third longitudinal vein simple.....13.
- 2.—First antennal joint less than twice the length of the second.....3.
First antennal joint more than twice the length of the second.....22.
- 3.—Eyes glabrous.....4.
Eyes pubescent.....24.
- 4.—Abdominal markings of the ♂ ♀ dissimilar.....5.
Abdominal markings of the ♂ ♀ similar.....6.
- 5.—Thorax: disc usually with two irregular markings.....**binotata** Loew.
Thorax: disc without markings (spines of the scutellum blunt).
varipes Loew.
- 6.—Face of both sexes yellow.....7.
Face of male black, female yellow.....**rufipes** Loew
- 7.—Abdominal markings triangular, attenuated and reaching the lateral margins.....**cineta** Oliv.
Abdominal markings triangular, not reaching the lateral margins.
dorsalis Fabr.
- 8.—Abdomen of the ♀ with transverse bands; ♂ with dorsal line.....9.
Abdomen of the ♀ with transverse bands; ♂ with only lateral markings at the posterior angles.....**inequalis** Loew.
- 9.—Scutellum and spines yellow.....**arcuata** Loew.
Scutellum and spines black.....**flava** Say.
- 10.—Scutellum more or less yellowish, without spines.....11.
Scutellum black, with spines.....12.
- 11.—Scutellum wholly yellow; black of the vertex does not extend over the vertical angle.....**fallax** n. sp.
Scutellum, base black; black of the vertex extends over the vertical angle; proboscis longer.....**nigrirostris** Loew.
- 12.—Wings: veins very dark brown, face produced.....**nigerrima** Loew.
Wings: veins reddish, face rounded, front broad.....**pilosus** Day.
- 13.—Scutellum ♀ wholly green; ♂ brownish.....14.
Scutellum ♀ black, with lateral margin green; ♂ black..**texasiana** n. sp.
- 14.—Thorax (♀) disc with two green stripes; ♂ pleuræ yellowish.
trivittata Say.
Thorax (♀) disc without stripes; ♂ pleuræ black.....**vertebrata** Say.
- 15.—Front and vertex black.....16.
Front and vertex red.....**hydroleonoides** n. sp.
- 16.—Pile (pubescence) on the mesonotum short.....17.
Pile (pubescence) on the mesonotum moderately long..**americana** Day.
- 17.—Abdomen with a wide dorsal line, usually narrower in the ♂ than in the female.....18.
Abdomen: dorsal line wanting; second, third, fourth and fifth segments entirely green.....**Aldrichi** n. sp.
- 18.—Front without yellow spots.....**virgo** Wied.
Front with yellow spots.....**pilimana** Loew.

- 19.—Abdomen black, with transverse marking, a lateral posterior angle.
 Abdomen black, with a wide, continuous, lateral margin, third antennal joint tapering to a fine point.....**microstoma** Loew.
- 20.—Femora black; abdominal markings on the ♂ usually not triangular...21.
 Femora yellow; abdominal markings on the ♂ usually triangular.
pubescens Day.
- 21.—Front and vertex marked with yellow.....**intermedia** Wied.
 Front and vertex wholly black.....**hoodiana** Bigot.
- 22.—First and second joints of the antennæ black.....23.
 First and second joints of the antennæ red.....24.
- 23.—Front and vertex wide, lateral thoracic stripe continuous.
hieroglyphica Oliv.
 Front and vertex narrow lateral thoracic stripe only posteriorly of the suture.
similis n. sp.
- 24.—Eyes pubescent; scutellum of the ♀ yellow.....25.
 Eyes glabrous; scutellum black, with yellow margin..**occipitalis** n. sp.
- 25.—Abdomen (♂) broad, with narrow markings pilose.....26.
 Abdomen (♂) narrow, with wide marking, pubescent..**flavicornis** Oliv.
- 26.—Antennæ long; first and second joints yellow, third black..**obscura** Oliv.
 Antennæ short; reddish or dark brown throughout.....**viridis** Bell.

Odontomyia binotata Loew (Pl. iii. figs. 29, 30, 31, 32).

Odontomyia megacephala Loew, Centur. vi. 20 (non *O. megacephala* Oliv.).

Odontomyia binotata Loew Centur. vi. 22; Day, Proc. Acad. Nat. Sci. Phila. 1882, 81.

Odontomyia bicolor Day, Proc. Acad. Nat. Sci. Phila. 1882, 78.

Length ♂ ♀ 11–14 mm. ♂.—Face, occiput and vertical angle green; vertical triangle black, ocelli yellowish, frontal triangle small, brownish; face with thin whitish pile, oral margins yellowish. Antennæ reddish; third joint dark brown, tip black, first and second joints subequal; palpi and proboscis yellow, end of the proboscis black. Thorax black with yellowish pile, long and dense on the sides; the green markings show the following variation: humeri and posterior angles green; marking at the posterior angle extends laterally to the suture; lateral stripe continuous from the humeri to the posterior angle, usually with two spots on the disc of the thorax; pleuræ green, pectus blackish; scutellum, basal half black, apical half green, sometimes totally greenish yellow; spines yellow, tips black. Abdomen green, with an irregular black dorsal stripe, reaching the posterior margin of the fifth segment and more or less contracted on the second and third segments, a small black spot is usually present at the anterior angle of the fourth segment; venter green. Legs reddish; basal half of the femora and tibiæ yellow, outer half of the femora, tibiæ and first joint of the tarsi reddish; tip of the tibiæ (especially the anterior and middle) and tip of the first and remaining joints of the tarsi brown, to brownish black. Wings hyaline, veins yellow, third longitudinal vein branched; discal cell emit three strong veins.

♀.—Face, front, occiput and vertical angle green; vertex, a wide, transverse line on the front midway between the antennæ and ocelli, and narrow lines at the vertical angle separating the green of the vertical from that of the occiput, black; in some specimens this latter character is wanting, and the vertical and frontal lines are narrowly connected by two longitudinal lines, thus forming three green spots on the front; in one specimen from Utah the frontal markings are

wanting. Thorax black, with thin yellowish pubescence; lateral stripe and two small spots on the disc of the thorax green, this latter character is variable, and may be wanting, or may be narrowly connected with humeri in some specimens, or with the posterior angle in others, or with both humeri and posterior angles, thus forming two irregular stripes; pleuræ green; pectus brownish; scutellum totally green; tips of the spines black, metanotum black. Abdomen green, marked with black as follows: first segment except the lateral margins; second with a large T-shaped marking; third with a large central triangle, laterally projected to the lateral margin; fourth similar, except that the central area is larger and more quadrate; anterior half of the fifth with a large central spot, the lateral projections not quite reaching the margins; in other specimens the markings on the third segment are keystone- or anvil-shaped, and contains two small greenish spots.

Los Angeles County, California (Coquillett); Utah (Aldrich); Denver, Col. (E. V. Beales); Texas (T. E. Hood, Boston, Soc. Nat. Hist.); Wallace County, Kansas (F. H. Snow); Lincoln, Neb., July (Univ. Neb.); Algonquin, Ill. (Dr. W. A. Nason); Elkhart, Ind. (J. R. Weith); Constantine, Mich. (U. S. Nat. Mus.).

An *O. megacephala* was described by Olivier (Ency. Meth. 432, viii) from Egypt; I therefore adopt the second name given by Loew.

***Odontomyia varipes* Loew.**

Odontomyia varipes Loew, Centur. vi, 21; Day, Proc. Acad. Nat. Sci. Phila. 1882, 84.

Length ♂ 12 mm.—Face green, vertical triangle black, ocelli yellowish, vertical angles green, frontal triangle minute, black; first two joints of the antennæ cylindrical, equal, reddish (third joint in the type specimen wanting); proboscis light yellow, labelli black. Thorax black, yellow pile; pleuræ, posterior angles and scutellum green; base of the latter with a triangular black spot, spines short, pectus black. Abdomen green, with an irregular dorsal stripe of black having the following characteristics on each segment: first except the posterior angles; second keystone-shaped, widest at the anterior margin; third somewhat wider than the second, slightly contracted in the middle, and attenuated along the anterior margin to the sides; fourth similar but slightly wider; fifth except a narrow lateral and posterior margin; venter wholly green. Femora yellow, outer half of the anterior, outer third of the middle and tip of the posterior femora, reddish; base of the tibiæ yellow; outer half of the tibiæ and tarsi reddish, brownish black at the extremities. Wings pure hyaline, veins yellow; third longitudinal vein forked, discal cell emits three equal veins.

Carolina (Loew).

The above description is based on the type specimen. The original description, describing the abdomen black with green markings, I have reversed, as this belongs to the group in which green predominates. It is closely related to *Odontomyia binotata*, but the head is smaller, the spines of the scutellum much shorter and blunt, legs darker, and the abdominal markings much different that the male of that species.

Odontomyia rufipes Loew.*Odontomyia rufipes* Loew, Centur. vi, 25, ♂.*Odontomyia scalaris* Loew, Centur. vi, 26, ♀.

Length ♂ 11 mm.—Head totally black; first two joints of the antennæ brownish black, subequal (third in the specimen described wanting). Face moderately prominent, convex, obtusely carinate, with whitish pile, proboscis black. Thorax totally black, with long whitish pile; on the pleuræ white and shaggy; scutellum yellow, base black. Abdomen yellow, with a medial stripe, on the anterior margin of the second segment dilated, the following segments with a single basal band wholly black; venter totally yellow. Legs reddish yellow; posterior tarsi in this specimen wanting. Wings pure hyaline, vein bright yellow; third longitudinal vein branched, discal cell emits two veins.

Length ♀ 11 mm.—Head yellow, occipital disc and an irregular vertical spot black; first two joints of the antennæ brownish black, subequal (third wanting). Face moderately prominent, convex, very obtusely carinate, pile white, medial stripe black; dorsal portion of the thorax black, golden pubescence, lateral margins with a wide border that extends from the humeri to the suture and the posterior angles yellow; pleuræ yellow, marked with black, pile white, pectus and metanotum black; scutellum totally yellow. Abdomen yellow, with a medial stripe; second and the following segments with a single anterior band of black; venter totally yellow. Legs reddish yellow; apex of the posterior tarsi brown. Wings pure hyaline, veins bright yellow, third longitudinal vein branched, discal cell emits two veins.

Cuba (Gundlach) Loew.

That these two descriptions apply to the same species as Mr. Loew suggests, there is not the slightest doubt.

Odontomyia cineta Olivier.

Odontomyia cineta Oliv., Encycl. Meth. viii, 432, 3; Macquart, Dipt. Exot. i, 2, 189; Day, Proc. Acad. Nat. Sci. Phila. 1882, 87.

Stratiomys cineta Walker, List, etc., v, 39.

Odontomyia extremis Day, Proc. Acad. Nat. Sci. Phila. 1882, 80; Williston, Can. Ent. xvii, 128.

Length ♂ ♀ 12 mm. ♂.—Face and frontal triangle light green, with whitish pile; vertical triangles and the proboscis black, ocelli yellow. Antennæ red, tip black. Thorax black with yellowish pile; lateral margins, scutellum and pleuræ green; basal centre of the scutellum black, spines yellow, tips brown, pectus black. Abdomen green, with a wide, irregular dorsal line of black, contracted at the posterior edge of the second and third segments, forming a triangular, or a keystone-shaped marking, that on the fourth square, and that on the fifth not reaching the posterior margin, and laterally attenuated to the margin; venter green. Legs yellow, three terminal joints of the tarsi. Wings hyaline, veins yellow; discal cell emits three veins, third longitudinal vein branched.

♀.—Face, front and occiput green, shining; frontal orbits with a prominent black spot; ocellar triangle black; in some specimens the black is laterally extended, and in one this is narrowly connected with the spots on the frontal orbits; the lateral strip of the thorax wider than in the male, and the tomentum golden yellow; scutellum totally green. Abdomen green, with a series of black dorsal triangles; in some there are laterally extended on the second and third segments

so as to form a band occupying one-half to two-thirds the anterior portion and usually narrowly reaching the posterior margin; band on the fifth segment occupying the anterior half. In other respects the color markings are the same as those of the male.

St. Augustine, Fla., March 15; Cape May, N. J., June 14; Brookings, S. D. (Aldrich); Connecticut (Williston); Douglas County, Kansas, June; Buffalo, N. Y. (Univ. Kans.); Algonquin, Ill. (Dr. Nason); West Point, Neb., June (Univ. Neb.).

I have recently received from Mr. V. H. Lowe, of the New York Agricultural Experiment Station, a ♀ specimen measuring only 8 mm.; it was taken at the Agricultural College, Michigan, June 17.

Odontomyia dorsalis Fabricius (Pl. iv, fig. 9).

Stratiomys dorsalis Fabr., Syst. Antl. 82, 20; Wiedemann, Auss. Zw. ii, 66.

Odontomyia dorsalis (Fabr.) Osten Sacken, Catl. 47 (non *O. dorsalis* White, Zool. Voy. Erebus and Terror).

Length ♀ 9 mm.; wing 8 mm.—Face, front, vertex and occiput, an obscure greenish yellow; translucent; minute yellowish pubescence, a spot on each side of the antennæ extending to the orbits; a transverse line obscurely interrupted on the front and a spot on each side of the ocelli brownish; ocellar triangle black, ocelli yellow. Antennæ and legs reddish brown, proboscis black. Thorax black, with short golden pubescence; a wide lateral line, pleuræ, scutellum and spines, yellow; pectus black, halteres green. Abdomen dingy yellow, with an irregular, blackish, dorsal line, consisting of a series of markings that are dilated at the anterior, and contracted at the posterior margins of the second, third and fourth segments; on the fifth it is only a small spot at the anterior margin; venter yellowish. Legs red, the last two joints of the tarsi brown. Wings hyaline, veins light yellow; discal cell emits three strong veins; third longitudinal vein branched.

One specimen, San Domingo (Frazer), University of Kansas coll.

This specimen agrees so well with Fabricius' brief description, that I feel very confident of its identification. Wiedemann gives its habitat as "South America," but Fabricius has "in Americæ Insulis."

Odontomyia inæqualis Loew.

Odontomyia inæqualis Loew, Centur. vi, 24.

Length ♂ 5½, ♀ 4¾ lin.; wing ♂ 4½, ♀ 3¾ lin. ♂.—Head black, middle of the lower part of the face, and from there to the edge of the anterior angle, light yellow. Antennæ black; first and second joints blackish, underside brown, proboscis black, palpi light yellow. Thorax black, pile yellow; pleuræ with two yellow spots, one irregular above the anterior coxæ; the other round in front of the wing; scutellum black, broad apical margin and very short spines greenish yellow, black at the extreme tip. Abdomen black; posterior margin of the second, third and fourth segments broadly interrupted, greenish yellow; on the second segment the markings are dilated and subtriangular, on the fourth somewhat obsolete; venter wholly greenish yellow. Legs yellow, tarsi from the apex

of the first joint brownish black. the base of the second is, however, lighter. Wings pure hyaline, veins decidedly yellowish, third longitudinal vein in one simple, in the other with an obsolete rudimentary branch, discoidal cell emits two veins.

♀.—Head yellow; occiput except the orbits black, front with four black spots, upper spots together with the minute black spot on the vertex confluent; thus also is formed a band on each side, which touches the margin of the eyes; the lower spots are obliquely drawn out, subcontiguous in the middle of the front and touching on each side the margin of the eyes. Face moderately prominent, convex, and adorned with a triangular black spot, proboscis black; palpi light yellow; dorsum of the thorax black, with a slightly golden tomentum, posterior angles greenish yellow; pleuræ greenish yellow, with a large black spot, which is connected with the black of the pectus; scutellum black, apical margin broad, spines small, greenish yellow; the extreme points black. Abdomen black, margins of the segments separate; lateral margins equal, posterior margins subequal, greenish yellow; venter totally greenish yellow. Legs yellowish (tarsi in the specimen described wanting). Wing pure hyaline, veins strongly yellowish, third longitudinal vein branched, discoidal cell emits two veins, fourth near the base very thin.

“Fort Resolution,” Hudson’s Bay Territory (Kennicott), Loew.

Odontomyia arcuata Loew (Pl. iii, fig. 35; Pl. iv, figs. 7, 8).

Odontomyia arcuata Loew, Centur. x, 4; Day, Proc. Acad. Nat. Sci. Phila. 1882, 80.

Length ♂ ♀ 9-11 mm. ♂.—Face and inferior orbits light yellow; pile white, an obscure transverse brownish line above the oral margin; frontal and vertical triangles black, ocelli yellow, proboscis black; first and second joints of the antennæ red; third dark brown, and narrowly annulated with black; dorsum of the thorax shining black; pile yellow, sparse, but long and dense on the sides; posterior angles obscure brown, pleuræ greenish yellow, pectus black; scutellum greenish yellow; base black, spines yellow, tip brown. Abdomen green, with an irregular black dorsal stripe, having the following contour: greatly contracted at the margins of the second and third; third and fourth, and the fourth and fifth segments, mark on the fourth segment somewhat wider than those on the second and third; mark on the fifth only extending to the centre of the segment, laterally attenuated; venter green. Legs yellow, tip of the first and the rest of the joints of the tarsi brown. Wings pure hyaline, veins light yellow, discal cell emits two strong veins, the other indicated only by an obsolete angle; third longitudinal vein branched.

♀.—Face, front, vertex and occiput yellow, pile light yellow; vertex and front with a transverse band of black, in the former not reaching the orbits, and sometimes narrowly extending in the middle over the vertical angle, in the latter sometimes narrowly divided in the middle and the frontal fossa is sometimes black, connecting the frontal and vertical bands. In some specimens there is a blackish, transverse marking above the oral margin, and in one specimen the facial prominence and a small dot on each side is also blackish; ocelli yellow, proboscis black; first and second joints of the antennæ red; third dark brown. Thorax black, with short, decumbent, golden-yellow pubescence, longer on the sides; posterior angles, pleuræ and in one specimen a small spot at the suture,

greenish yellow; pectus black; scutellum yellow, base narrowly black. Abdomen greenish yellow; second, third, fourth and fifth segments with a wide, transverse, black band, which does not reach the lateral or posterior margins; posterior edge of the bands on the second, third and fourth segments biarcuate; in some specimens this character is obsolete, or arcuated on the fourth. In the ten specimens before me this character predominates, although it is not typical; in one specimen which closely resembles the type the marking on the second segment is triangular, and on the other segments the biarcuate edge is wanting, and the anterior edge does not quite reach the margin of the segment towards the lateral portions.

Six females, Los Angeles County, California, and one male San Bernardino Mountains, California, July 28 (Coquillett); Texas (Henshaw, coll. L. E. Hood); Denver, Col. (Beales); Rapid City, S. D. (Aldrich); Reno, Nev. (Hillman).

The male from South Dakota differs in having the the upper portion of the face and the pleuræ black; still it undoubtedly belongs to this species.

***Odontomyia flava* Day.**

Odontomyia flava Day, Proc. Acad. Nat. Sci. Phila. 1882, 76; Williston, Can. Ent. xvii, 128.

♂.—Black. Head concolorous, antennæ black. Face small, black, clothed with yellowish pile; borders of the mouth slightly reddish. Thorax black, clothed with golden pile; scutellum black, the terminal spines concolorous, halteres yellow. Abdomen yellow, with black median stripe, the yellow running in at the incisures, thus forming connected quadrangular black spots in the segments; venter yellow, immaculate. Legs yellowish; femora brown; tarsi black, anterior and middle tibiæ with a solitary brownish ring. Wings hyaline, veins yellow, third longitudinal simple, the discal cell emits three veins, the posterior being rudimentary. Long. corp. $5\frac{1}{2}$ lin.; long. al. 4 lin.

Hab.—Wyoming (Dr. Williston). Original description.

The following is Dr. Williston's description and remarks on this species in the "Canadian Entomologist."

"The type specimen in my collection is partly destroyed by *Anthreni*. I give as complete a description as it will permit.

"Length 11 mm. Head black, face of usual size, with two obscure yellowish spots below clothed with light colored pile; dorsum of the thorax black, with rather long light pile; scutellum black, the spines of the same color rather small and approximate. Abdomen black, with a rather narrow yellow margin, and with two slender, broadly interrupted, yellow posterior cross-bands (on the second and third segments); venter yellow. Legs yellow; femora at their base and the distal part of the tarsi brown, the tibiæ in their middle with a brownish ring. Wing hyaline, veins yellow, third longitudinal vein furcate, third posterior vein rudimentary.

"Como, Wyo. Resembles *O. inequalis* Loew, but differs in the scutellum and abdomen.

Odontomyia fallax n. sp.

Length 8 mm. ♀.—Face, front and occiput greenish yellow; shining, with sparse whitish pile; vertex, an irregular transverse band on the front extending downward in the centre and connecting with the subquadrate marking surrounding the antennæ, and a spot on each side of the oral margin black. Antennæ wholly black. Thorax black; tomentum yellow; lateral stripe and pleuræ greenish; lateral stripe sometimes slightly interrupted at the suture; scutellum entirely yellow, without spines. Abdomen black, second segment with triangular markings; third and fourth with subtriangular markings at the posterior angles, and the posterior margin of the fifth greenish yellow; venter greenish yellow. Femora and the outer half of the tibiæ black; all except the first joint of the tarsi brownish black; tip of the femora, basal half of the tibiæ and first joint of the tarsi reddish. Wings hyaline, veins yellow, third longitudinal vein branched, discal cell emits three veins.

Four specimens, southern Georgia (Morrison), U. S. Nat. Mus.

Odontomyia nigrirostris Loew (Pl. iii, figs. 36, 37).

Odontomyia nigrirostris Loew, Centur. vi, 19; Day, Proc. Acad. Nat. Sci. Phila. 1882, 83.

? *Exchostoma caloceps* Bigot, Ann. Soc. Ent. France, 1879, 217.

Length ♂ ♀ 12 mm. ♂.—Face, vertical and frontal triangles black, shining; face with long, whitish pile; epistoma, cheeks and inferior orbits yellowish; ocelli yellow. Antennæ black; proboscis long, black. Thorax and pleuræ black with long yellowish pile; scutellum black, with a wide yellow margin; without spines. Abdomen black, marked with yellow; a small marking at the posterior angle of the first segment, which, with the large lateral marking on the second, forms a triangle; those on the third and fourth consisting of an irregular transverse mark at the lateral posterior margin, fifth with a narrow posterior margin; venter yellow. Legs black, tips of the coxæ, base and tip of the femora, basal half of the tibiæ and first joint of the tarsi, yellow. Wings hyaline, veins yellow; discal cell emits three veins, third longitudinal vein branched.

♀.—Face, front and occiput yellow; shining, pubescence yellow, face with a large heart-shaped spot, and the vertex black, the black extending along the frontal orbits about half way down the front, leaving a middle line of yellow, which is contracted in the middle and forked at the top, but not quite reaching the ocellar triangle; in one specimen the black extends entirely across the upper portion of the front leaving only two small spots below the ocelli; a black line extends from the vertex over the vertical angle. Thorax black, pilose on the sides and pleuræ, humeri small, spot at the suture, posterior angle and pleuræ yellow, spot at the suture sometimes obsolete; pectus black, two small black dots on the pleuræ, one below the humeri and the other below the base of the wing; scutellum yellow, base (in the centre) black; marking on the first and second segments more prominent than in the male; that on the first much wider than the anterior edge of the second, posterior edge attenuated along the posterior margin; inner margin curved and forming, with the marking on the first segment, a half circle; in other respects it resembles the male in color.

Constantine, Mich. (Aldrich); Denver, Col. (E. V. Beales); Mantua Park, Col. (F. H. Snow, Univ. Kans.); Custer, S. D.; Big Horn Mountains, Wyoming (Univ. Neb.).

Odontomyia nigerrima Loew.

Odontomyia nigerrima Loew, Centur. x, 6; Day, Proc. Acad. Nat. Sci. Phila 1882, 82.

The following is Loew's description of the female:

Long. corp. 4 lin.; long. al. $3\frac{1}{2}$ lin.—Black, shining, bare, short whitish pubescence. Head concolorous, longitudinal fossa of the front and both margins testaceous. Face extraordinarily prominent, protuberant, obtuse; lateral margins of the mouth strongly dilated; proboscis black, stock slender; head long and very thick. Antennæ slender, black; first joint once and a half as long as the second; scutellum wholly black, teeth fusco-testaceous; posterior margins of the second abdominal segment; third and fourth towards the side of the abdomen of a lutescent color, thus three narrow bands are seen broadly interrupted; the posterior margin of the fifth segment wholly lutescent; venter black, with a broad unequal disc, darkly lutescent; this abdominal picture in living specimens I suspect to be wholly green. Legs black, apex of the femora, base and apex of the tibiæ and first and last joints of the tarsi, except the apex, "fusco-luteo-testaceous." Wings hyaline, veins strongly brownish black; costal and third longitudinal subfuscous towards the apex, third longitudinal vein with erect branch, discoidal cell emits two veins

Middle States (Loew).

A male from Buffalo, N. Y. (Pl. iv, fig. 25), in the collection of the Kansas University I doubtfully refer to this species, it agrees with the type, except that the third longitudinal vein is simple.

Length ♂ 8 mm.—Face black; shining with long whitish pile; facial protuberance very prominent, obtuse; vertical triangle black. Thorax black, with prominent blackish pile; scutellum black, spines yellow. Abdomen black; second, third and fourth segments with small, subtriangular yellow spots at the posterior angles; fifth with prominent lateral and posterior margins; venter greenish yellow. Femora black; tips of the femora, the tibiæ and tarsi, yellowish; medial portion of the tibiæ and the last two joints of the tarsi brown. Wings hyaline, veins dark brown; discal cell emits two veins, third longitudinal vein simple.

Odontomyia pilosus Day (Pl. iv, figs. 13, 14).

Odontomyia pilosus Day, Proc. Acad. Nat. Sci. Phila. 1882, 76.

Odontomyia pyrrhostoma Bigot, Ann. Soc. Ent. France, 1887, 25.

Length ♂ ♀ 11 mm. ♂.—Face and vertical triangle black; face with long, dense, whitish pile; oral margin and ocelli yellowish. Antennæ black. Thorax and pleuræ black, with long yellowish pile; scutellum black, apical margin between the spines and the spines yellow. Abdomen black, shining, with long yellowish pile; second and third segments with a subtriangular yellow marking on the lateral posterior margin; in some specimens these are contracted at the angle, so that they reach the lateral edge only by a narrow line; markings on the fourth segment less prominent; fifth segment with a narrow lateral and posterior margin; venter yellow, with two small brownish dots in the middle of the third and fourth segments. Femora black; coxæ, tip of the femora, basal half of the tibiæ and basal joint of the tarsi yellow, tarsi and outer half of the tibiæ brown; the underside of the tibiæ shows an apical and middle annuli of black. Wings

hyaline, veins brown; discal cell emits two veins, third longitudinal vein branched.

♀.—Face, front and vertex black, dense yellowish tomentum on the face and occiput; vertical angle, a longitudinal line on each side of the frontal foveæ, oral margin and the lower part of the occiput yellowish; in one specimen the markings on the vertex and front are wanting; dorsum of the thorax and the scutellum with a dense yellowish tomentum, pilose on the pleuræ and pectus; abdominal marking less prominent than in the male, and not subtriangular.

Los Angeles County and Santa Clara County, California, April (Coquillett); Kern County, California (Univ. Kans.).

***Odontomyia texasiana* n. sp.**

Length ♂ ♀ 9 mm. ♂.—Face black, with light yellow pile. Antennæ red; first and tip of the third joints black, proboscis black. Thorax black, with yellow pile, posterior angle yellowish; scutellum black, narrowly margined with dark yellow, spines yellow. Thorax black, with prominent, yellow, triangular markings at the posterior angles of the second, third and fourth segments; fifth with a narrow lateral and posterior margin; venter green. Femora black; tip of the femora, the tibiæ and tarsi red; tip of the tibiæ (sometimes) and the terminal joint of the tarsi brownish. Wings hyaline, veins yellow; third longitudinal vein simple, discal cell emits three veins.

♀.—Facial orbits, front, vertical angle and occiput green; vertex, two oblique angular spots on the front, which are narrowly connected with the black above the base of the antennæ and the face, black. Antennæ red; first and tip of the third joints black. Thorax black, with yellowish pubescence; a continuous lateral line, or only the humeri, an elongated spot before the suture and the posterior angles green; pleuræ green, sternum black; scutellum black, with wide lateral margins of green; spines yellow. Abdomen black; second, third and fourth segments with lateral, subtriangular markings that are greatly attenuated along the posterior margins; on third and fourth these are sometimes united, forming a wide posterior margin; fifth with a wide lateral and posterior margin.

Texas (Amer. Ent. Soc.); Waco, Texas (Belfrage), coll. C. V. Riley, U. S. Nat. Mus.

***Odontomyia trivittata* Say (Pl. iv, fig. 19).**

Stratiomys trivittata Say, Jour. Ac. Nat. Sci. Phila. vi, 160; Compl. Wr. ii, 356.

Odontomyia tritæniata Bellardi. Saggio, etc., i, 38, tab. i, fig. 17.

Odontomyia tritæniata Osten Sacken, Biol. Cent.-Amer. Dipt. 36.

Length ♂ ♀ 6-8 mm. ♀.—Face, front, vertex and occiput greenish yellow; a small black dot on each side of the facial prominence; a transverse, wavy line across the front that projects downward above the antennæ; a spot on the orbits opposite the base of the antennæ, and a spot on each side of the ocelli brownish (the frontal markings vary considerably, and are sometimes obsolete); ocellar area and proboscis black. Antennæ yellowish, tips brownish. Thorax brownish black, narrowly divided by green lines into three broad vittæ, these are widest anteriorly, and gradually attenuated posteriorly; lateral stripe, pleuræ and scutellum green, spines yellow; metanotum and pectus brownish black. Abdomen greenish, with a more or less prominent, black, interrupted, dorsal line, the black markings surrounded by a brownish stain; venter green. Legs yellow, terminal

joints of the tarsi brownish. Wings hyaline, veins yellow; third longitudinal veins simple, discal cell emits three strong veins.

♂.—Face and base of the vertical triangle yellowish; vertical triangle black. Thorax black; lateral stripe (obsolete near the humeri), pleuræ and scutellum yellowish; base of the scutellum brown.

Ten specimens; Bird's Island, near Astor, Fla., May 11; St. Augustine, Fla. (F. H. Genning); Colorado (collection C. V. Riley, U. S. Nat. Mus.); City of Mexico (Sallé); Cuantle, Mex. (de Sausure); Guatemala (Champion).

The specimen (♂) from Texas has the abdomen greatly discolored (brownish). Most of the specimens before me have been collected for some time, and are greenish yellow, but a specimen (♀) recently collected near Astor, Fla., is bright green. A specimen (♂) recently taken by Mrs. Slosson at Ormond, Fla., the abdomen is bright green.

***Odontomyia vertebrata* Say (Pl. iv, figs. 26, 27, 28).**

Odontomyia vertebrata Say, Long's Exped. App. 369; Compl. Wr. 251; Wiedemann, Auss. Zw. ii, 73, 20; Bellardi, Saggio, etc., i, 38; Day, Proc. Acad. Nat. Sci. Phila. 1882, 85.

Stratiomys vertebrata Walker, List, etc., v, 39.

Odontomyia Willistoni Day, Proc. Acad. Nat. Sci. Phila. 1882, 78, ♀.

Length ♂ 8 mm.—Face brownish; cheeks and oral margins black, facial prominence red. Antennæ brown, base and tip black; ocellar triangle black. Thorax black, with whitish pubescence; posterior angle and scutellum red, base black, spines light green. Abdomen yellowish white, with a variable dorsal line of black, extending to the anterior part of the fifth segment; in some this line resembles that of *O. plebeja*, but with edges more irregular, in others the line on the second and third segments is narrow, and of a brownish color, while in others it is broadly interrupted, the markings on the second and third segments consisting only of a spot at the anterior margins; the size of the roundish marking on the fourth segment is quite constant; venter yellowish white. Legs yellow. Wings hyaline, veins light yellow, discal cell emits three veins, third longitudinal vein simple.

Length ♀ 9 mm.—Face smooth, shining: front and vertex rugose; face and front bearing two or three colors; green with yellow and brownish black markings, or a uniform yellow with the brownish black markings: the latter are arranged as follows: a spot more or less prominent on each side of the oral margin: a spot on each side of the facial prominence, a transverse line above the antennæ not reaching the eyes; an irregular transverse line across the front and vertex, the ends of the latter sometimes curved downward and connecting with the former; they are sometimes also connected by a central longitudinal line extending from the ocelli, giving the front a reticulated appearance; occiput green, or greenish yellow. Antennæ black, second joint brown. Thorax black, with short golden pubescence, forming in certain lights two dorsal stripes; humeri green, a green lateral stripe commences just before the suture and extends to the base of the scutellum; this stripe contains a small black spot above the base of the wing;

scutellum green, spines yellow; pleuræ green, with irregular black markings; pectus black. Black of the abdomen consisting of a series of broad bands rarely reaching the lateral margin, and having a triangle or square of green or greenish yellow at the posterior angle; posterior edge of the band on the fifth segment with a deep sinus.

Fifteen specimens (♂ ♀), "the neck," Philadelphia, June 27 (Charles Liebeck); Anglesea, N. J. (♂ ♀), July 19; South Dakota ♂ ♀ (Aldrich); Agricultural College, Michigan (Davis); Newtonville, Mass. (Henshaw); St. Louis, Mo., July 28 (Riley); Mexico? (Bellardi). I am doubtful whether Bellardi had Say's species.

Odontomyia hydrolenoides n. sp. (Pl. iv, fig. 10).

Length ♀ 7-10 mm.—Front, vertex, occiput and upper half of the face reddish, lower half of the face blackish; base of the antennæ surrounded by black, from which extends the following more or less prominent lines: a narrow line to the ocellar triangle, a wider one over the facial prominence, the oblique lines to the black on the lower part of the face and a narrow transverse line to the lower part of the face; ocellar triangle black, the black extending over the vertical angle. Thorax black, with short yellowish pubescence; scutellum black, apex and spines brownish (in one specimen yellow), spines very short. Abdomen green, with a wide and quite regular black dorsal stripe; venter green. Legs yellow. Wings hyaline, veins light yellow; discal cell emits two veins and shows an angulation at the origin of the third vein, third longitudinal vein simple.

Toronto, Canada, July 7 (Wm. Brodie); Agricultural College, Michigan, July 23 (Davis); Illinois (Amer. Ent. Soc.); Ogden, Utah, June 20 (collection C. V. Riley, U. S. Nat. Mus.).

I was inclined at first to consider this an introduced species (*O. hydroleon* Linné, of Europe), but in comparing these with a specimen from Germany, I hardly felt justified in uniting the two. The European species differs from this in having the face almost wholly reddish, the front and vertex noticeably narrower, the spines of the scutellum almost double the size and apical margin more prominent, and the dorsal stripe of the abdomen wider and more irregular. The force of the suggestion that *O. hydroleon* has been introduced, seems somewhat lessened when we consider the wide distribution of this species. The male will probably closely resemble that of *O. virgo* or *O. pilimana*.

Odontomyia americana Day.

Odontomyia americana Day. Proc. Acad. Nat. Sci. Phila. 1882, 77.

♂.—Black. Head black. Antennæ reddish brown; the second joint as long, or longer than the first. Face small, not prominent; proboscis black. Thorax black and covered with a yellowish white pubescence; scutellum the same, the apical spines being yellow; halteres green. Abdomen green, with a median black stripe of nearly equal breadth throughout; venter green, immaculate.

Legs yellow. Wings hyaline, veins yellow, the third longitudinal simple, the discoidal cell emitting two veins. Long. corp. 4 lin.; long. al. 3 lin.

Hab.—California (Baron).

The above is Dr. Day's original description. To this Mr. W. A. Snow adds the following: "Head black, near oral margin brownish. Antennæ reddish. Face strongly receding; pile white. Thorax black, punctate, pile long, obscure whitish; scutellum at the apex and the spines yellow; halteres green, third vein is simple, four posterior cells. Length 9 mm. Two males, California (Baron). In the Kan. Univ. collection."

Six females from Yakima City, Wash., in the Osten Sacken collection at Cambridge, labeled *O. americana* Day, has the face and front a uniform shining black, and the median black abdominal stripe nearly of a equal with and not dilated as in the female *O. virgo* Wied. The latter has not been recorded west of Kansas.

Dr. Williston says, "*O. americana* Day, is very distinct in the moderately long pile (not 'pubescence') of the metanotum."

***Odontomyia Aldrichi* n. sp. (Pl. iv, fig. 17).**

Length ♂ ♀ 9-10 mm.—Face and vertical triangle black; shining with whitish pile on the cheeks and facial orbits. Antennæ reddish, tip of the third joint black. Thorax black, with yellowish white pile, which is longest on the pleuræ and pectus; scutellum black, apical margin between the spines and spines yellow. Abdomen entirely green, except a small, black, lunate spot in the middle of the first segment; in one specimen this is divided into two small arcuate spots; venter green. Legs yellow. Wings hyaline, veins yellow; discal cell emits two veins, the third indicated only by a slight angle of the discal cell, third longitudinal vein simple.

♀.—Face, front and vertex black, shining; pile sparse, whitish and arranged in tufts on the frontal and facial orbits; occiput black, with a dense, yellowish pubescence; two small yellow spots on each side of the frontal fossa, below the ocelli. Thorax black, with short yellow pubescence, whitish on the pleuræ; scutellum black, with black pubescence; inferior apical margin yellow.

Riley County, Kansas, June (Marlatt); Sand Hills, Neb., July ♂ (Aldrich), with the same habitat and data ♀; and West Point, Neb., ♂ June (Univ. Neb.).

***Odontomyia virgo* Wiedemann (Pl. iv, figs. 31, 32, 33, 34, 35).**

Odontomyia virgo Wied., Auss. Zw. ii, 69, 13.

Stratiomys virgo Walker, List, etc., v, 39.

Odontomyia plebeja Loew, Centur. x, 5.

Odontomyia nigra Day, Proc. Acad. Nat. Sci. Phila. 1882, 75.

Odontomyia paron Walker, List, etc., iii, 536.

Length ♂ ♀ 7-10 mm.; wing 6-8 mm. ♂.—Face black, shining, with whitish pile; ocellar triangular black, ocelli brownish. Antennæ reddish, terminal joint dark brown. Thorax black, covered with yellowish pubescence, longest on the

pleuræ; scutellum black, spines yellow; halteres green. Abdomen varies from a bright green to greenish yellow, or bright yellow, with an irregular black dorsal stripe, forming on the second, third and fourth segments a series of keystone-shaped markings, that on the fourth being usually the largest, stripe ending with a triangular spot at the base of the fifth segment; venter green. Legs yellow. Wings hyaline, veins yellow, discal cell emits two veins; third longitudinal vein simple.

♀.—Face, front and vertex broad, shining black, with white pile, more conspicuous in patches on the orbits; inferior orbits yellow; occiput with thick whitish pubescence. Thorax black, with short yellowish white pubescence; the abdominal stripe usually wider than in the male, so that the green on the third, fourth and fifth segments consists only of a narrow lateral, and on the fifth a posterior margin.

Southeastern Pennsylvania and southern New Jersey, June and July, common; Franconia, N. H. (Mrs. Slosson); Connecticut and Virginia, June 13 (Williston); Algonquin, Ill. (Dr. Nason); Custer, S. D. (Aldrich); West Point, Neb., June 24 (Univ. Neb.); Kansas (E. W. Guilding) Day; Georgia (Wiedemann); southern Georgia (Morrison); Colorado (Riley); Texas (J. B. Smith); Springfield, Mass. (Dimmock); Agricultural College, Michigan (Lowe); Murfreesborough, N. C., June 8.

The above description is based on a series of over forty specimens. Between the smaller specimen determined as *O. virgo* by Loew, and a somewhat larger one, the type of his *O. plebeja*, I cannot draw the line. The color of the antennæ are variable, the third joint is sometimes reddish, except the tip; in others it is wholly dark brown, while others show intermediate conditions.

Odontomyia pilimana Loew (Pl. iv, figs. 11, 12).

Odontomyia pilimana Loew, Centur. vi, 27; Day, Proc. Acad. Nat. Sci. Phila. 1882, 83.

Length 9 mm.; wing 7 mm. ♀.—Face, front and vertex black, shining, with whitish pile, which is more conspicuous in patches along the orbits; a spot on the lower part of the facial orbit and two small spots below the ocelli on each side of the frontal fossa yellow; occiput with dense whitish pubescence. Antennæ red, tip of the third joint black; proboscis black. Thorax black, with a dense aureus pubescence, whitish on the pleuræ; scutellum black, spines yellow; halteres green. Abdomen greenish yellow, with a black dorsal stripe, narrow on the first and second, and expanding to three times this width on the third and fourth; fifth with an anterior central spot, leaving a posterior and lateral margin of uniform width; venter green, or greenish yellow. Legs yellow. Wings hyaline, veins yellow, third longitudinal with branch; discal cell emits two valid and one rudimentary vein; four posterior cells and one submarginal.

♂.—Face, frontal and vertical angle black, with sparse whitish pile; ocelli yellow, facial protuberance prominent, obtusely carinate; the abdominal stripe not as wide on the third and fourth segments as in the female.

Brookings, S. D. (Aldrich); Champaign County, Illinois (W. A. Snow); Algonquin, Ill. (Dr. Nason); West Point, Neb., July (Univ. Neb.).

Odontomyia microstoma Loew (Pl. iv, fig. 20).

Odontomyia microstoma Loew, Centur. vi, 28.

Length ♀ 12 mm.—Face, front and vertex yellow, sparsely covered with yellow pile below the antennæ, shining above: first two joints of the antennæ brown, base of the first and outer end of the second darker, terminal joint black, gradually tapering to a point; about half way between the antennæ and ocelli is a short, transverse line or spot; ocellar triangle black, and on each side a brownish spot; occiput yellow. Thorax black, densely clothed with short, yellow tomentum; humerus and posterior angle yellow; scutellum yellow, spines tipped with black, pectus black. Abdomen with a broad, brownish black dorsal stripe, with lateral margins of yellow, the dorsal stripes varies greatly in color from a uniform black with a yellowish triangle on the posterior margin of the fourth segment to a brownish yellow, with the posterior margins of the segments darker and sometimes a yellow interrupted dorsal line; venter yellow, with a dark brown marginal stripe. Legs yellow, two or three of the terminal joints of the posterior tarsi brown. Wings hyaline, veins yellow, third longitudinal vein simple, discoidal cell emits two veins.

Length ♂ 10 mm.—Face and vertical triangle black, the former with yellow pile. Antennæ black. Thorax uniform black, pile yellow; scutellum black, with a broad posterior margin of yellow. Abdominal markings uniform black, the yellow triangle on the fourth segment very small or wanting. Femora, except the tip, brownish black, a brown band on the middle of the tibiæ, and the posterior tarsi brownish.

Common at Anglesea, N. J., July 19; Cape May, June 22; Maryland (Aldrich); New York (Williston); Chelsea, Mass., July 31 (Henshaw).

I have only collected and received this species from localities near the sea-shore. In the form of the third antennal joint there is quite a divergence from the typical *Odontomyia*. A universal study of this group may give it generic or subgeneric rank. Loew refers to it as follows: "The last two segments of the third antennal joint in this species forms a sufficiently acute style, as may be shown; the antennæ of this are not dissimilar to those of *Clitellaria*, but the downward course of the veins in this species demonstrates its place in the *Odontomyia*."

Odontomyia pubescens Day (Pl. iv, figs. 15, 16).

Odontomyia pubescens Day, Proc. Acad. Nat. Sci. Phila. 1882, 77.

Length ♀ 10 mm.: wing 8 mm.—Face and front black with yellow pubescence, which is lighter and longer on the face; frontal longitudinal fossa with its margins and a spot on each side of the ocelli yellow. Antennæ black. Thorax black, with short, golden-yellow pubescence; scutellum black, apical margin and spines

red. Abdomen black, with yellow transverse markings at the lateral posterior margins of the second, third and fourth segments less prominent on the fourth; the markings on the second and third gradually enlarge toward the inner end; posterior margin of the fifth and lateral margins of all the segments yellow; venter yellow. Legs totally reddish yellow. Wings hyaline, veins yellow, discal cell emits two veins.

Described from a type specimen, the venter of which is discolored. In the twenty specimens before me the venter (unless discolored) is of a uniform greenish yellow; the abdominal markings vary considerably, being sometimes of a uniform width. The color markings on the front and vertex were apparently disregarded in the original description.

♂.—The yellow pile of the thorax is longer, the apical margin of the scutellum slightly narrower and the abdominal marking more prominent, and sometimes of a subtriangular form on the second segment.

In the specimens before me I see no trace of black on the tip of the femora as originally described.

Denver, Col. (Beales); West Point, Neb., May; Brookings, S. D., June 11 (Aldrich); Agricultural College, Michigan (Davis); Brookline, Mass., May 27, June 12; and White Mountains, N. H. (Henshaw); Maine; Canada (Mus. Comp. Zool.); Arizona (Wiliston); California (Baron); Algonquin, Ill., June 4 (Dr. W. A. Nason).

The specimens from the Central States are somewhat smaller (8 mm.). In the Museum of Comparative Zoology, in Loew's hand writing, is a MS. name for this species (*Odontomyia latipes*). This species may readily be distinguished from *O. intermedia* Wied. by its uniform reddish yellow legs. Mr. Snow has informed me, and it has been verified by Mr. Henshaw, by whom they were collected, that the habitat New York, for the types, should be Massachusetts. Day took the label "Brook." for Brooklyn, N. Y., instead of Brookline, Mass.

Odontomyia interrupta Olivier (Pl. iv, figs. 29, 30).

Odontomyia interrupta Oliv., Encycl. Meth. viii, 433, 8.

Odontomyia intermedia Wied., Auss. Zw. ii, 64, 5.

Stratiomys intermedia Walker, List, etc., v, 38.

Length ♂ ♀ 8 mm. ♂.—Face black, with whitish pile, thickest on the sides; ocellar triangle, antennæ and proboscis black. Thorax black, with whitish pile; scutellum black, apex brown, spines yellow. Abdomen black, the lateral posterior margin of the second, third and fourth segments light yellow, or greenish yellow, thus three bands are seen broadly interrupted in the middle; this intermediate space being about one-third the total width of the abdomen; fifth with a narrow

posterior margin and all the segments with a narrow lateral margin; the markings on the second segment are sometimes widened at the lateral margin forming a triangle at the posterior angle; venter greenish. Femora black, tip of the femora, basal half of the tibiæ and tarsi, yellow; outer half of the tibiæ and tarsi brown; in some specimens the tibiæ and tarsi are almost a uniform yellow, or yellowish red; in the latter case the posterior coxæ are more or less yellow. Wings hyaline, veins yellow, discal cell emits two veins, third longitudinal vein simple.

♀.—Face black with white pile, front black with yellow pile; frontal longitudinal fossa with its margins and a spot on each side of the ocelli, yellow; pubescence of the thorax short and of a golden-yellow; margin of the scutellum prominent and yellow. Legs usually lighter than the ♂.

Philadelphia, May 15; Brookline, Mass., May 27, June 12 (Henshaw); New York and Franconia, N. H. (Mrs. Slosson); Algonquin, Ill., June 8 (Dr. W. A. Nason); Brookings, S. D.; West Point, Neb., April (Aldrich); Minnesota (Amer. Ent. Soc.); Carolina (Olivier).

The black femora and the more regular size of the abdominal markings distinguishes this species from the preceding, "except the 'Rand mahl ven braun' the description of *Odontomyia intermedia* applies exactly to this species." MS. note of Osten Sacken, Museum of Comparative Zoology.

The species is also marked "*O. crassirostris*," a MS. name given by Loew in his collection at Cambridge.

***Odontomyia hoodiana* Bigot.**

Odontomyia hoodiana Bigot, Ann. Soc. Ent. France, xxxviii, 1886, 25.

Length ♂ ♀ 8-10 mm. ♂.—Face black, shining, with long yellow pile, vertical triangle black, ocelli yellow. Antennæ black. Thorax black, shining, pile yellow, long and dense on the pleuræ; scutellum black, shining, apical margin between the spines and the spines yellow. Abdomen black, shining, pile yellow, sparse; second, third and fourth segments with a transverse yellow marking at the lateral posterior margin; lateral and posterior margins of the fifth yellow; venter greenish yellow. Femora black; tips of the femora, tibiæ and tarsi yellow, tibiæ with a medial band of black or brown, the outer portion of the tarsi brown. Wings hyaline, veins reddish, discal cell emits two veins, the third indicated only by an obsolete angle.

♀.—Face, front and vertex black, pile yellow. Thorax black, pubescence short, yellow, procumbent; scutellum black, apical margin between the spines and spine yellow. Abdomen black, shining, markings somewhat narrower than in the male.

Tuolumne County, California; British Columbia (Coquillett); Craig's Mountain, Idaho (Aldrich).

This species is nearest related to *O. interrupta* Oliv. and *O. pubescens* Day, but differs in the absence of yellow markings on the front and vertex, and the less prominent margin of the scutellum.

The only point in which these specimens differs from Bigot's description is in the abdominal markings, "demi-bande subtriangle fauve," but considering the great variation of its nearest allied species, especially in the male, which was Bigot's type; I can only refer these specimens to this species.

Odontomyia hieroglyphica Olivier (Pl. iv, figs. 4, 5).

Odontomyia hieroglyphica Oliv., Encycl. Meth. viii, 434.

Length ♂ 10 mm.—Face black, pile yellow, facial protuberance prominent; occiput and a transverse facial marking (contracted in the middle) between the oral margin and the facial protuberance but not reaching the eyes, yellow. Antennæ brownish black; base of the first and second joints reddish. Thorax black, with long, thick, yellowish pile; scutellum black; lower edge of the outer margin yellow, spines small, yellow. Abdomen black, pile yellow, much wider than the thorax; second segment with a large lateral triangle; third and fourth with a subtriangular marking at the posterior angles, largest on the third; posterior margin of the fifth and the lateral margins of all except the first segment, yellow; venter greenish yellow; fourth segment with a medial, black square, in the centre of which is a yellow spot; fifth with a narrow anterior margin. Femora black; distal half of the tibiæ and last two joints of the tarsi, brown; tips of the femora, basal half of the tibiæ and tarsi yellow. Wings hyaline, veins light yellow, discal cell emits three veins, third longitudinal vein simple.

Length ♀ 11 mm.—Face, front, vertical angles and occiput, green; shining, with sparse, yellow pubescence; a subquadrate black spot surrounds the base of the antennæ; the lower edge of which has prominent projections at the angles and on the facial prominence, the latter connecting with the edges of the oral margin; a short, transverse line extends on each side from the frontal orbits about midway between the antennæ and vertex, and a line the width of the ocelli across the vertex black. Antennæ and proboscis black. Thorax black, with short, yellowish pubescence; humeri, lateral stripe and scutellum, green; spines yellow; pleuræ green, with a black spot that is connected with the black on the pectus. Abdomen black: first segment with small, green triangles at the posterior angles; second with prominent ones, those on the third about one-half the size of those on the second, and those on the fourth about one-half the size of those on the third; posterior margin of the fifth, and a narrow lateral margin on all the segments and venter green. Legs black; tips of the femora, basal half of the tibiæ, and the first three joints of the tarsi yellow; the outer half of the anterior and middle tibiæ are brownish black. Wings yellowish hyaline, veins brown, discal cell emits three veins; third longitudinal vein simple.

Massachusetts, July (Univ. Kans.); Virginia (Amer. Ent. Soc.); District of Columbia, May 19; Allegheny, Pa., June 7 (Aldrich); Carolina (Loew); Morris County, N. J., June 25.

Odontomyia similis n. sp. (Pl. iv, fig. 6).

Length ♀ 10 mm.; wing 8 mm.—Face, front and occiput, yellow; shining, with yellow pile; edge of the oral margin black and connected with a large, black, arrow-shaped spot that surrounds the antennæ; from this extends a frontal line about half way to the ocelli, and from this extends, at right angles, wavy

lines to the orbits; vertex, antennæ and proboscis black. Thorax black, with yellow pile, a small spot at the humeri; posterior angles and a lateral line extending to the base of the suture, yellow; pleuræ yellow, with two black spots, the anterior one connected with the black of the pectus; scutellum yellow; spines small, halteres light yellow. Abdomen black, with yellow and black pile; second segment with a subtriangular marking at the lateral posterior angles; third and fourth with a transverse marking on the lateral posterior margins; that on the fourth about one-half the size of that on the third; fifth with a lateral and posterior margin; lateral margin narrowing anteriorly; vertex yellow. Femora black, distal half of the tibiæ brownish black, the anterior and middle tibiæ showing on the underside an apical and medial annuli, tip of the femora and base of the tibiæ yellow, base of the tarsi red, the remainder a dark brown. Wings hyaline, veins reddish, discal cell emits three veins.

One specimen, Colorado (J. M. Aldrich).

This species is nearest allied to *O. hieroglyphica*, but differs in having a much narrower front, a short longitudinal frontal line of black, the absence of a continuous lateral line on the thorax and narrower abdomen. The specimen before me is bright yellow, while *O. hieroglyphica* is bright green, but this is of little moment.

Odontomyia occipitalis n. sp. (Pl. iv, figs. 23, 24).

Length ♂ ♀ 10 mm. ♂.—Face, frontal and vertical triangle black; shining, with whitish pile; lower half of the face more or less yellowish. Antennæ, first and basal half of the second brown, outer half of the second, and the third black; ocelli yellow. Thorax black, with yellowish pile; most prominent on the pleuræ; pleuræ marked irregularly with yellow (in one specimen black), pectus and scutellum black; a narrow apical margin between the spines and the spines yellow; spine very small. Abdomen black, segments marked with yellow as follows: second with a wide, lateral margin, slightly protracted along the lateral posterior margin; third and fourth with a narrow lateral margin and a triangle at the posterior angles (in one specimen obsolete on the fourth); fifth with a narrow, lateral and posterior margin; venter yellow; base of the third, fourth and fifth segments narrowly margined with black; margin interrupted on the third. Legs black, tip of the femora, base of the tibiæ and tarsi yellow; outer half of the tarsi brownish. Wings hyaline, veins dark brown; discal cell emits three veins, third longitudinal vein simple.

♀.—Face, front and occiput yellow, the latter very prominent: mouth, and on each side, and at the upper angle of the oral margin, black; a large, black, transverse spot surrounds the base of the antennæ, which project above and below the antennæ and at the lower corners; a transverse black spot extends from the frontal orbits and almost connects with that surrounding the antennæ: a large black spot surrounds the ocelli, which is very narrowly attenuated to the vertical orbits; a narrow line also extends over the vertical angle. Thorax dull black, with very short yellowish pubescence; posterior angle, from which extends a post-alar line nearly reaching the suture, and the pleuræ yellow; scutellum black, widely margined with yellow. Abdomen dull black; the markings differ from those of the male in being less triangular, and might be described as lateral mar-

gins, slightly widening at the posterior angles; posterior margin of the fifth subtriangular, there is also an obsolete spot near the posterior angle of the first segment; tarsi lighter than in the male.

Pennsylvania; Virginia (Amer. Ent. Soc.).

The above description is based on one female (Pennsylvania) and two males (Virginia) in the collection of the American Entomological Society. In antennal characters it closely resembles *O. flavicornis* Oliv., but the eyes of the male are glabrous. The species is readily distinguished by its dull black color and absence of prominent lateral transverse markings.

***Odontomyia flavicornis* Olivier (Pl. iv, figs. 21, 22).**

Odontomyia flavicornis Oliv., Ency. Meth. viii, 433, 9; Macquart, Hist. Nat. Dipt. i, 243, 4; Day, Proc. Acad. Nat. Sci. 1882, 87.

Stratiomys flaviceps Macquart, Hist. Nat. i, 245.

Stratiomys coronata Guérin, Iconogr. Texte, 544, tab. 98, fig. 5.

Stratiomys pulchella Macquart, Dipt. Exot. i, 1. 180, 3; tab. xxii, fig. 2.

Stratiomys vicina Macquart, Dipt. Exot. i, 1. 181, 4 ("♂ of *S. flaviceps* ?") (non *Odontomyia vicina* Macq., Dipt. Exot. i, 188, 11, Cuba).

Odontomyia lasiophthalma Loew, Centur. vi, 23, ♂.

Length ♂ 9 mm.; wing 7 mm.—Face black, whitish pubescence, a spot on the facial orbits and on each side of the oral margin yellow; eyes conspicuously pilose; first and second joints of the antennæ yellow, third brownish black; the first joint more than double the length of the second. Thorax black, with yellowish pile; posterior angle, a large angular and small ovate spot on the pleuræ, yellow; scutellum black, narrow margin and spines yellow, spines small, halteres green. Abdomen black, with greenish yellow markings; second segment with large lateral triangles; third with a subtriangular marking at the posterior angles, not reaching the anterior margin; fourth with transverse markings at the lateral posterior margin; fifth with lateral and posterior margin; venter greenish yellow. Femora black; tips of the femora, tibiae and tarsi yellow, posterior tibiae with a middle and apical band, and the tips of the tarsal joints red. Wings hyaline, veins light yellow, discal cell emits three veins, third longitudinal vein simple.

♀.—Face, front and occiput yellow; vertex, a large quadrate spot surrounding the antennæ, an M-shaped marking on the front, facial groove and a spot on the epistoma margin black. Thorax black, with yellow pubescence; humeri, lateral stripe, scutellum and pleuræ, yellow; pectus black. Abdomen black, lateral margin of the first, a large triangle in the posterior angles of the second and third, an elongated spot at the posterior angle of the fourth occupying about two-fifths of the posterior margin; posterior margin of the fifth, and a narrow lateral margin on all the segments, yellow; venter yellow.

Delaware County, Pennsylvania, July 7. Two specimens, Illinois (Amer. Ent. Soc.); New York (Loew); Caldwell, N. J. (Crane); North Carolina (Riley).

Odontomyia obscura Olivier.

Odontomyia obscura Oliv., Ency. Meth. viii, 433, 7; Macquart, Dipt. Exot. i, 2, 189; Day, Proc. Acad. Nat. Sci. Phila. 1882, 88.

Odontomyia brevipennis Oliv., Ency. Meth. viii, 434, 13; Day, Proc. Acad. Nat. Sci. Phila. 1882, 86.

? *Stratiomys obscura* Walker, List, etc., v, 38.

Length ♂ 10 mm.—Face and vertical triangle black with yellow pile; first and second joints of the antennæ yellow, extreme tips of each brownish; third joint black, proboscis black. Thorax black, densely covered with yellow pile; scutellum black, spines small, yellow; halteres greenish. Abdomen black, with dense yellow pile; second and third segments with yellow triangles at the posterior angles (smallest on the third), which are greatly attenuated along the posterior margin; a narrow lateral margin of yellow to all except the first segment; there is a slight extension of this margin along the posterior edge of the fourth; venter yellow, slightly marked with black. Femora black, tips of the femora, tibiæ and tarsi yellow, an obsolete medial and apical band on the anterior and middle tibiæ and the outer half of the posterior tibiæ brownish. Wings hyaline, veins yellow, discal cell emits three veins, third longitudinal simple.

♀.—Face, front and vertex black; shining, with whitish pile, facial protuberance prominent; vertical angle, occiput, a transverse band across the upper portion of the front (slightly interrupted), two irregular spots between this and the antennæ, which are laterally attenuated and narrowly connected with spots on the orbits opposite the base of the antennæ; cheeks and a spot on each side of the upper angle of the epistoma yellow. Thorax black, with yellowish pubescence, pilose on the pleuræ and pectus; an irregular spot on the pleuræ and scutellum greenish yellow; spines yellow and very small. Abdomen black; the yellow triangles are obsolete, but indicated by the much longer, whitish tomentum, two yellow subdorsal spots on the posterior margin of the second segment represent the inner angles of the triangles so prominent in the male; a narrow, continuous, lateral margin to all except the first segment, and the posterior margin of the fifth yellow; venter black, posterior margin of the first, and a large quadrate mark on the second, greenish yellow.

St. Augustine, Fla., ♂; Charlotte Harbor, Fla., March, ♂ ♀ (Mrs. Slosson); Carolina (Olivier); Boykins and Norfolk, Va., June 10, 12.

Olivier undoubtedly had the male and female of the same species. The specimens before me agree so well with his descriptions that I have no doubt of their identity.

Odontomyia viridis Bellardi (Pl. iv, fig. 18).

Odontomyia viridis Bell., Saggio, etc., i, 36, tab. i, fig. 16.

♀.—Green, marked with black. Head broad, front very broad, with transverse black stripes; first on the vertex; third at the base of the antennæ; second intermediate, arcuate, and interrupted; eyes small, obsoletely tomentose; posterior margin green. Antennæ short, reddish. Face green, prominent, with two black spots, epistoma near the sides black, palpi yellow, proboscis thick, wholly black; dorsum of the thorax black, golden tomentum; a broad, green, longitudinal stripe from the humeri to the base of the wings; lateral margin black,

pleuræ green, pectus black; scutellum green, spines yellow, very short, halteres green. Abdomen short, depressed, subquadrate, posterior subtruncate; green with black markings; first segment immaculate, marking on the second triangular, anterior and posterior dilated, near the side curved; third, fourth and fifth broadly marked, anterior dilated, posterior attenuated, marking along the whole anterior margin of the segments, except on the fifth; posterior margin not contiguous; venter green. Femora black; extreme tip of the femora, tibiæ and tarsi yellow; extremity of the tarsi brown. Wings hyaline, anterior margin yellowish. Length 7 mm.; wing 14 mm.

Cuantla, Mexico (Saussure), Bellardi.

Length ♂ 9 mm.—Face black, with whitish pile; facial tubercle very prominent, obtuse, shining; occiput and inferior orbits obscurely yellow, vertical triangle and a line extending over the vertical angle black; eyes covered with a long whitish pile. Antennæ dark brown. Thorax black, with long, dense, yellowish pile; posterior angle yellowish; scutellum black, sides narrowly margined with yellow, and with yellowish pile. Abdomen with a wide, irregular, dorsal stripe of black, leaving the following yellowish markings; a prominent lateral triangle on the second, third and fourth segments (those on the second and third contiguous, while those on the fourth confined to the posterior angles) and a narrow lateral and posterior margin on the fifth; venter green. Femora black; tip of the femora, tibiæ and tarsi, yellow; the two terminal joints of the tarsi brown. Wings hyaline, veins yellow, discal emits three veins, third longitudinal vein branched.

Texas ♂ (Amer. Ent. Soc.) Waco, Texas ♀ (coll. C. V. Riley), U. S. Nat. Museum.

Bellardi described only the ♀, with which the specimen I have examined agree so well, that I think there is no doubt of its determination.

***Odontomyia mexicana* n. sp.**

Length ♂ ♀ 6 mm. ♂.—Face black, shining, with sparse, whitish pile; oral margins yellow. Antennæ yellow, third joint brownish. Thorax and scutellum black, with whitish pile; spines yellow. Abdomen greenish white, with an irregular black dorsal stripe, consisting of a wide spot on the first, a narrow triangular marking on the second and third, a roundish mark on the fourth, and a small spot at the anterior margin of the fifth; venter greenish white. Legs yellow; femora, except the tip and terminal joint, brownish. Wings hyaline, veins light yellow, discal cell emits three veins.

♀.—Face, front, vertex and occiput, greenish yellow; a transverse line on the vertex, an interrupted line on the front, a line or spot on each side of the antennæ, not reaching the orbits, a spot on each side of the facial prominence and mouth, black. Thorax black; pleuræ and a lateral stripe green, lateral stripe tapering anteriorly; scutellum green. Abdomen greenish, dorsal stripe interrupted, consisting of a small spot on the first, a small spot at the base of the second and third, a larger spot reaching both margins on the fourth, and a small spot at the base of the fifth segment.

Tehuantepec, Mexico (collection C. V. Riley, U. S. Nat. Museum).

This may possibly be the species referred to *O. vertebrata* Say, by Bellardi. I doubt if Bellardi and Say had the same species.

Doubtful and Undetermined Species.

Odontomyia Lefebvrei Macquart.

Odontomyia Lefebvrei Macquart, Dipt. Exot. i, 1, 189.

Odontomyia Lefebvrei Bellardi, Saggio, etc., i, 33.

Stratiomys Lefebvrei Walker, List, etc., v, 40, et 311.

Face vert, un peu crénéé á petits spoils blancs; antennes; les deux premiers articles verdâtres, troisieme noir, á premiere division jaunatre, et les suivantes également jaunâtres-en-dessous seulement. Thorax noir, a poils jaunâtres; cotes et poitrine verts, á poils blancs; écusson vert a base noire pointes vertes, a extremite noire. Abdomen vert a large bande dorsal noire legerement crenelée a chaque segment; un point noir de chaque cote des troisieme et quatrieme, au bord antérieur; ventre vert. Pied vert; cuisses antérieures á extrémité noir; intermediaires et posterieures également terminees de noir en-dessus seulement; jambes d'un vert jaunatre, á moitis posterieure noire; tarses noirs; premier article des posterieurs a base jaunatre. Balanciers vert ailes claires, a bord extérieur jaunatre cinq cellules posterieures (Macquart).

Mexico ♂ 5½ l.

♂.—Green and black. Head thick. Thorax broad; eyes naked, contiguous at the base of the front; above minute and below very minutely reticulated; behind black, margined with green; occiput green, maculate; front small, triangular, black, pile yellow; ocelli greenish, first and second joints of the antennæ yellow, third black; face prominent, carinate, green; pile silvery, palpi yellow; proboscis yellow, apex black. Thorax subrotundate, slightly convex, shining, black; pile dense, yellow, a small broad green spot extends from near the base of the wings to that of the scutellum; pleuræ and pectus green, pile white, scutellum green, base black, halteres green, base yellow. Abdomen subquadrate, depressed, green; all the segments with a dorsal stripe, stripe broad, black; sides subregular; anterior margins of segments subdentate, lateral margin of the abdomen with black dots; dots either four, two, or wanting; venter convex, green, pile silvery. Legs greenish yellow; upperside of the apex of the femora marked with black; tibiæ at the apex broadly black; tarsi black, base of the first joint reddish. Wings longer than the abdomen, hyaline, anterior margin yellow.

♀.—Front broad, above black, with obsolete green dots, below green; eyes small, naked, very minutely reticulated, posterior margin thick, green; occiput green, with two black stripes; pubescence on the thorax thin, a broad lateral margin from the humeri to the scutellum green; scutellum totally green. Abdomen broad, black, maculated with green, first segment scarcely maculated near the margins; lateral margin of the second broadly maculated, the anterior and posterior margins of the macula produced, falcated towards the dorsal line; lateral margin of the third and fourth subrotundate, lateral and posterior margins contiguous, and divided at the highest part of the segment; fifth segment immaculate, posterior with a transverse band of green (Bellardi).

Length ♂ 15 mm.; wings 24 mm. ♀ 16 mm.; wings 28 mm.

Mexico (Craveri, Truqui); Orizaba, Toluca (de Saussure),

Odontomyia Truquii Bellardi.

Odontomyia Truquii Bellardi, Saggio, etc., i, 37, tab. 1, fig. 11.

"Black and green. Head broad, front broadly black, above with two green spots, below green; ocelli brownish; occiput green, with obsolete, lateral, brown marks; eyes small, bare, minutely and regularly reticulated, posterior margin thick, green; first and second joints of the antennæ brown, third black; face green, shining, carinate, white tomentose on the middle, thin, subnaked; palpi greenish white, proboscis yellow, apex black. Thorax black, with thin, short, golden pubescence; lateral margin from the humeri to the scutellum with a broad green stripe; pleuræ and pectus green, pile white; scutellum totally green, spines yellow; halteres green, base yellowish. Abdomen broad, depressed, black maculated with green; first segment near the margins scarcely marked, second broadly marked, lateral margin contiguous, anterior and posterior margins produced, the appendix round towards the elongated median line, third and fourth with a subquadrate macula, lateral and posterior margins contiguous, fifth with a posterior margin; venter green, with very short, silvery tomentum. Legs green and brown, base of the femora green, near the apex, and especially on the upperside, brownish; base of the tibiæ and base of the first joint of the tarsi broadly brownish; apex of the tibiæ and tarsi black. Wings hyaline, anterior margin yellowish, base brownish. Length 16 mm.; wings 28 mm." (Bellardi)

Cuernavaco, Mexico (Truqui). Collection of Bellardi.

"Allied to the preceding [*O. Lefebvrei*,] but distinguished by the first antennal joint being brown, large macula on front, and the figure of the marking on the second segment, quadrate markings on the third and fourth segments and the femora, being spotted with brown." (Bellardi)

This is certainly very close to *O. binotata* Loew, and may prove to be that species; if so, it has priority.

Odontomyia prasina Jaennicke.

Odontomyia prasina Jaennicke, Nese. Exot. Dipt. 16 (in the Abhandl. d. Senckenb. Ges. vol. vi).

♂.—Green, thorax black, with yellowish pilose. Abdomen with a black stripe and two lateral black dots. Antennæ black. Length 13 mm.

Mexico. "This species stands very close to *O. Lefebvrei* Macq. (Dipt. Exot. i, 189); it is, however, distinguished from the same as follows:

"1. The first two antennal joints are black, and the second is, at the base and at the tip, clear brownish red; the third joint is black above, beneath clear brownish red.

"2. The thorax above is covered with fox-red pubescence.

"3. The femora are entirely yellow without black markings, otherwise everything as in *O. Lefebvrei* Macq., Mus. Darmst." (Jaennicke).

Odontomyia affinis Bellardi.

Odontomyia affinis Bell., Saggio, etc., i, 35; tab. i, 12.

♀.—Black and yellow. Head broad, front broadly black above, below yellow, with two black, arcuate stripes. Antennæ black, second joint yellow; face prominent, carinate, yellow; pile white, obsolete; palpi yellow, apex brown, proboscis towards the extremity black; eyes small, bare; posterior margin broadly yellow; occiput yellow, binotated with chestnut. Thorax black, yellow tomentum, posterior marked with green; pleuræ and pectus greenish yellow, pile yellow; scutellum totally green, spines yellow, halteres green, base yellow. Abdomen rather long, depressed, with a broad, continuous, medial, black stripe; margins subparallel, anterior angles of the third and fourth segments with a lateral black dot; venter yellow, immaculate, bare. Legs yellow; femora, tibiæ and first joint of the tarsi yellow; apex of the tibiæ and first joint of the tarsi and all of the other joints of the tarsi, black. Wings hyaline, anterior margin brownish (Bellardi).

Length 13 mm.; wings 23 mm.

Puebla, Mexico (de Saussure). Collection of de Saussure.

Odontomyia dissimilis Bellardi.

Odontomyia dissimilis Bell., Saggio, etc., i, 35; tab. i, figs. 13, 14.

♂.—Black, maculated with yellow. Head small; eyes naked and contiguous at the base of front, above minute, and below very minutely reticulated; front and occiput black; ocelli pale. Antennæ short, black; face scarcely prominent, carinate, black yellow pile; epistoma maculate with yellow near the sides. Thorax slightly convex, black, immaculate, yellow pile; pleuræ and pectus black, golden-yellow pile; scutellum black, margined with yellow; halteres light yellow, base brown. Abdomen elongate, depressed, light yellow, with dorsal stripe, stripe black, irregular, first segment totally black; markings on the second and third segments broad, posteriorly attenuate; fourth subquadrate; fifth subtrapezoidal; venter yellow, base with two black spots. Legs black and yellow; base of the femora broadly black, apex yellow; tibiæ yellow, apex brown; tarsi blackish, base of the first joint yellow. Wings hyaline, near the anterior margin scarcely yellow.

♀.—Front broad, yellow, with three black, transverse stripes, first on the vertex, third at the base of the antennæ and towards the face acutely dentate, second intermediate, arcuated in the middle; posterior margin of the eye light yellow; pubescence on the thorax very short, golden, marked with yellow on the posterior margin between the base of the wings and scutellum; pleuræ light yellow, pectus black. Abdomen black, lateral and posterior margins of the segments yellow, base of the anterior femora narrowly black, posterior brown, scarcely marked with black (Bellardi).

Length 11 mm.; wings 18 mm.

City of Mexico (Truqui). Collection Bellardi.

Odontomyia quadrimaculata Bellardi.

Odontomyia quadrimaculata Bell., Saggio, etc., i, 37, tab. i, 15.

♂.—Black, with reddish yellow marking and yellow pile. Head small, eyes pubescent and contiguous near the base of the front; front small, ocelli pale. Antennæ short, black; face prominent, black, shining, pile yellow; proboscis black. Thorax, pleuræ, pectus and scutellum black, pile yellow; spines of the

scutellum short, yellowish; halteres yellow. Abdomen broad, short, suborbicular, depressed, black; third and fourth segments near the angle of the lateral and posterior margins marked with reddish yellow, margins of the fifth segment reddish; venter reddish yellow; base and inferior vitta of femora black; apex of the femora, the tibiæ and tarsi reddish yellow; apex of the tarsi brown. Wings hyaline, anterior margin yellowish (Bellardi).

Length 7 mm.; wing 14 mm.

Mexico (Craveri). Collection of Bellardi.

***Odontomyia femorata* Bellardi.**

Odontomyia femorata Bell., Saggio, etc., i, 37.

♀.—Black, marked with yellow; tomentum yellow; front broad, black, with a transverse stripe and two dots near the base of the antennæ yellow; first and second joints of the antennæ black, third wanting; face yellowish, with obsolete yellow hairs, strongly produced, middle tuberculate, tubercle marked with brown, margins of the epistoma marked with black; proboscis black. Thorax black, tomentose yellow; lateral margins and posterior macula yellowish; pleuræ yellow, pectus black; scutellum black, with a broad yellow border, spines yellow; halteres yellow. Abdomen depressed, black, tomentose yellow; second, third and fourth segments near the lateral margin yellowish; venter yellow, immaculate. Legs yellow, underside of the anterior and posterior with a short black vitta, apex of the tarsi brown. Wings hyaline. Length 8 mm.; wing 16 mm. (Bellardi).

Toluca, Mexico (de Saussure). Collection de Saussure.

This may possibly be the ♀ of the preceding (*O. quadrimaculata*).

***Odontomyia emarginata* Macquart.**

Odontomyia emarginata Macquart, Dipt. Exot. i, 1, 190.

Stratiomys emarginata Walker, List, etc., v, 40.

Length $4\frac{1}{2}$ l. ♂.—Black. Abdomen yellow, with a broad, biemarginate, black stripe. Face a little prominent, black, with short, white pile. "*Front antérieurment blanc.*" Antennæ black. Thorax entirely black, with short yellow pile; posterior border of the scutellum and spines yellow. Abdomen yellow (perhaps green when living), a large dorsal strip of black, profoundly indented at the posterior margin of the second and third segments; venter greenish yellow. Legs tawny or brownish, femora more or less black above; tarsi brown; halteres white. Wings hyaline, outer margin slightly yellow, five posterior cells.

Mexico (Macquart).

***Odontomyia flavifasciata* Macquart.**

Odontomyia flavifasciata Macquart, Dipt. Exot. 4e, Suppl. 53.

Length 6 l. ♀.—Black. Abdomen maculated on the sides with yellow; second segment with a yellow band. Face greenish yellow, carinate; front black and prominently separated by grooves in four parts; base yellow. Antennæ, first and second joints testaceous, third black; back of the head margined with yellow. Thorax black, a yellow stripe extends from the anterior to the posterior margin on each side above the insertion of the wings; pleuræ and pectus green, with a long yellow spot; pile yellow; scutellum yellow. Abdomen black; second segment with a large band of greenish yellow interrupted in the middle; third and fourth with an almost square yellow spot on each side; fifth margined with

yellow; first three segments of the venter yellowish, posterior margin of the third black; fourth yellow, with a central spot and posterior margin of black; fifth with four spots on the anterior margin, and the posterior margin yellow. Femora greenish yellow, tips testaceous; tibiæ testaceous, tips of the anterior ones brown, tarsi black, metatarsi testaceous: outer margin of the wings yellow, five posterior cells.

Mexico (Macquart).

Odontomyia rubricornis Macquart.

Odontomyia rubricornis Macquart, Dipt. Exot. Suppl. i, 53.

Antennæ testaceous, apex brown. Thorax bluish black. Abdomen white, dorsal stripe black; posterior legs brown, middle of the femora black.

Length $2\frac{1}{2}$ l. ♂.—Near to *O. viridula*. Face black, shining; front black, with lines. Antennæ dark testaceous, tips black. Thorax bluish black, with a thin white pubescence; margin of the scutellum and spines yellow. Abdomen yellowish white; first, second and third segments with a dorsal stripe of black, enlarged at the two extremities; stripe much more wider on the fourth and fifth segments, but not reaching the sides; venter white, a little brown at the tips of the tibiæ and the joints of the tarsi. Wings hyaline.

Merida, Yucatan.

Odontomyia limbipennis Macquart.

Odontomyia limbipennis Macq., Dipt. Exot. Suppl. ii, 30, 24.

Stratiomys limbipennis Walker, List, etc., v, 39.

“The label in Macquart’s hand-writing in Mr. Bigot’s collection bears *America* with a query. The query is omitted in the Dipt. Exot. I doubt that this is a North American species” (Osten Sacken).

Odontomyia albomaculata Macquart.

Odontomyia albomaculata Macquart, Dipt. Exot. i, 1, 189.

Stratiomys albomaculata Walker, List, etc., v, 40.

Length $4\frac{1}{2}$ l. ♀.—Thorax black, scutellum red. Abdomen dark blue, maculated with white. Legs black, first joint of the tarsi white. Face even, inclined, tawny, pubescence whitish; front narrow, tawny, back of head tawny. Antennæ tawny, first joint brown, as well as the last division of the third. Thorax black, with a line of whitish pubescence; spine of the scutellum yellow. Abdomen blackish blue, each segment with a lateral whitish spot and pubescence; underside of the body whitish pubescence. Legs black, knees tawny; halteres white. Wings grayish, veins brown, with five posterior cells.

Port au Prince, San Domingo [Hayti], (Macquart).

Odontomyia vicina Macquart.

Odontomyia vicina Macquart, Dipt. Exot. i, 188.

Stratiomys vicina Walker, List, etc., v, 40.

Length 3 l. ♀.—Black. Abdomen green, with a narrow black dorsal stripe, the apex dilated. Resembles *O. viridis*; the first two joints of the antennæ brownish, testaceous, third imperfect; the black stripe of the abdomen narrow on the first three segments, wide on the fourth.

Cuba. Collection of M. Serville (Macquart).

Odontomyia maculifrons Walker.*Odontomyia maculifrons* Walker, List, etc., iii, 536.

"Niger, capite viridi, nigro maculato, thorace pectoreque flavo-marginacis, scutello viridi dentibus duabus flavis armato, abdomine flavo, disc nigro, antennis fulvis apice piceis, pedibus flavis, femoribus nigro fasciatus, alis limpidis."

"Head apple-green, full as broad as the chest, smooth, shining, adorned with five pairs of black marks; first pair forming a short band on each side of the eyelets; second pair forming more slender curved bands; third and fifth pairs forming four dots; fourth pair forming two larger spots; eyes and eyelets piceous, the former with a band across the middle; mouth black, feelers piceous, longer than the head; first and second joints tawny, long; first joint shining, third and following joints short; chest black, clothed with tawny hairs, adorned on each side with a yellow stripe, which is narrow in front; breast black, sides yellow; scutellum apple-green, armed with two short, pale yellow teeth. Abdomen yellow, nearly as broad as long, wider, but not longer than the chest; yellow, clothed with long, pale yellow hairs; disc black above, especially on the part. Legs yellow, hips black, a black band on each thigh. Wings colorless; wing-ribs, veins and poisers yellow. Length of the body $2\frac{1}{2}$ lines, of the wings 4 lines" (Walker)

Honduras (Walker).

Odontomyia canadensis Walker.*Stratiomys canadensis* Walk., List, etc., v, 310.

"Nigra. Abdomen viride, vitta dorsali nigra, basi dilatata, lateribus angulatis. postice rotundata, apicem fere attingente; pedes testacei; alæ limpidæ, ad costam subtestaceæ, venis pallides; halteres testacei, apice pomacei."

"Nearly allied to *S. paron* male.—Black, proboscis and antennæ black. Thorax clothed with pale hairs; scutellum black, with two black spines. Abdomen green, with a black dorsal stripe, which extends nearly to the hind border; this stripe occupies nearly the whole breadth of the first segment; on the second it decreases in breadth from the fore to the hind border; on the third and on the fourth it has nearly parallel sides, but is broader on the fourth than on the third; on the fifth it is nearly semicircular. Legs testaceous. Wings limpid, with a testaceous tinge along the costa, veins white, testaceous towards the costa; halteres testaceous, with apple-green knobs. Length of the body $3\frac{1}{2}$ lines, of the wings 7 lines" (Walker).

I should refer this species to *O. virgo* if it were not for "antennæ black" and the scutellum "armed with two black spines."

EXPLANATION OF PLATE III.

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- Figs. 1- 2.—*Stratiomyia barbata* Loew, ♂ ♀.
 “ 3- 4.— “ *melastoma* Loew, ♂ ♀.
 “ 5- 6.— “ *lativentris* Loew, ♂ ♀.
 “ 7- 8.— “ *Bruneri* n. sp. ♂ ♀.
 “ 9.— “ *laticeps* Loew, ♂.
 “ 10.— “ *senaria* Loew, ♀.
 “ 11-12.— “ *badius* Walker, ♂ ♀.
 “ 13-15.— “ *maculosa* Loew, ♂ ♀ ♀.
 “ 16.— “ *normula* Loew, ♀.
 “ 17-18.— “ *norma* Wied., ♂ ♀.
 “ 19-20.— “ *unilimbata* Loew, ♂ ♀.
 “ 21-22.— “ *Meigenii* Wied., ♂ ♀.
 “ 23-24.— “ *apicula* Loew, ♂ ♀.
 “ 25-26.— “ *quaternaria* Loew, ♂ ♀.
 “ 27-28.— “ *discalis* Loew, ♂ ♀.
 “ 29-32.—*Odontomyia binotata* Loew, ♂ ♂ ♀ ♀.
 “ 33-34.— “ *cincta* Olivier, ♂ ♀.
 “ 35.— “ *arcuata* Loew, ♀.
 “ 36-37.— “ *nigrirostris* Loew, ♂ ♀.
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EXPLANATION OF PLATE IV.

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- Figs. 1- 2.—*Stratiomyia constans* Loew, ♂ ♀.
 “ 3.— “ *mutabilis* Fabr., ♂.
 “ 4- 5.—*Odontomyia hieroglyphica* Olivier, ♂ ♀.
 “ 6.— “ *similis* n. sp. ♀.
 “ 7- 8.— “ *arcuata* Loew, ♂ ♀.
 “ 9.— “ *dorsalis* Fabr., ♀.
 “ 10.— “ *hydroleonoides* n. sp. ♀.
 “ 11-12.— “ *pilimana* Loew, ♂ ♀.
 “ 13-14.— “ *pilosus* Day, ♂ ♀.
 “ 15-16.— “ *pubescens* Day, ♂ ♀.
 “ 17.— “ *Aldrichi* n. sp. ♂.
 “ 18.— “ *viridis* Bellardi, ♂.
 “ 19.— “ *trivittata* Say, ♀.
 “ 20.— “ *microstoma* Loew, ♂.
 “ 21-22.— “ *flavicornis* Olivier, ♂ ♀.
 “ 23-24.— “ *occipitalis* n. sp. ♂ ♀.
 “ 25.— “ *nigerrima* Loew, ? ♂.
 “ 26-28.— “ *vertebrata* Say, ♂ ♂ ♀.
 “ 29-30.— “ *interrupta* Olivier, ♂ ♀.
 “ 31-35.— “ *virgo* Wied., ♂ ♂ ♀ ♀ ♀.



